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DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT AND CERTAIN INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1988

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS UNITED STATES SENATE

ONE HUNDREDTH CONGRESS

FIRST SESSION

ON

H.R. 2783

AN ACT MAKING APPROPRIATIONS FOR THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT AND FOR SUNDRY INDEPENDENT AGENCIES, BOARDS, COMMISSIONS, CORPORATIONS, AND OFFICES FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 1988, AND FOR OTHER PURPOSES

PART 2 (Pages 905-1289)

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL HOME LOAN BANK BOARD
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
NATIONAL INSTITUTE OF BUILDING SCIENCES
NEIGHBORHOOD REINVESTMENT CORPORATION

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DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT-INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1988

WEDNESDAY, APRIL 1, 1987

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10 a.m. in room SD–124, Dirksen Senate Office Building, Hon. William Proxmire (chairman) presiding.

Present: Senators Proxmire, Lautenberg, Mikulski, Garn, D'Amato, Grassley, and Nickles.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

STATEMENT OF HON. SAMUEL R. PIERCE JR., SECRETARY, DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

ACCOMPANIED BY:
- ALBERT J. KLIMAN, DEPARTMENTAL BUDGET OFFICER
- J. MICHAEL DORSEY, GENERAL COUNSEL
- THOMAS T. DEMERY, ASSISTANT SECRETARY FOR HOUSING, FEDERAL HOUSING COMMISSIONER
- JAMES BAUGH, GENERAL DEPUTY ASSISTANT SECRETARY FOR PUBLIC AND INDIAN HOUSING
- JACK STOKVIS, GENERAL DEPUTY ASSISTANT SECRETARY FOR COMMUNITY PLANNING AND DEVELOPMENT
- JUNE KOCH, ASSISTANT SECRETARY FOR POLICY DEVELOPMENT AND RESEARCH
- JUDITH L. HOFMANN, ASSISTANT SECRETARY FOR ADMINISTRATION

BUDGET REQUEST

Senator PROXMIRE. The subcommittee will come to order.

Our principal witness today is the Secretary of Housing and Urban Development, who will discuss the Department's fiscal year 1988 budget with the subcommittee.

Secretary Pierce, you are requesting a total of $10.2 billion next year, including $8.2 billion in new budget authority to be provided through the appropriations process. That is a cut of about $4.8 billion in the amount we provided last year, with the primary reduction to be taken in assisted housing and a smaller reduction to be taken in community development programs.

The budget you are recommending would terminate virtually all new housing construction commitments with the exception of 1,000 units of Indian housing, although some new construction funds would be carried forward from the current fiscal year. It would also kill the Urban Development Action Grant Program.

I am the author of that program, but I agree with you 100 percent. It should be killed.

Secretary Pierce, you have a tough budget to sell because the cuts you are proposing are far deeper than those suggested for any other agency under this subcommittee's jurisdiction, and possibly deeper than cuts proposed for any other federal agency.

I know that many of my colleagues will feel that your Department has already more than paid its fair share of the deficit-reduction bill, and it will be up to you to convince them otherwise. I do not envy you your task.

I see you have submitted an 11-page prepared statement. If you would care to summarize it, I can assure you it will be printed in the hearing record in its entirety.

Before you go ahead with your statement, I am going to call on Senator D'Amato for any remarks he would like to make.

REMARKS OF SENATOR D'AMATO

Senator D'AMATO. Thank you very much, Mr. Chairman. Unfortunately, with the press of my legislative duties, I will not be able to stay for as long as I would like to. But I would like to at this time, Mr. Chairman, take the time to commend Sam Pierce.

Secretary Pierce is one of the nicest, the most caring, concerned people I have ever had the privilege of meeting, let alone a person who comes down here to do service for the public at great, great sacrifice to himself and to his family at great cost, having given up a tremendously lucrative practice.

I take the time out to say this, because it seems to me that that is an agency that has been, and will continue to be, kind of a whipping boy. It is an easy target. Theirs is the job and the task assigned to meet the nation's housing needs. How easily we say that, recognizing that with limited resources, et cetera, and the varied and complex problems, social, economic, et cetera, that it is a virtually impossible job and certainly cannot be left to them alone.

Theirs is the area, as you so rightfully pointed out, Mr. Chairman, that has already absorbed so much in the way of cuts. Theirs is the area where, so many times in the rush to attempt to do the people's business and promote housing and economic stability and revitalization of communities, programs are legislated and then the implementation is left to them with all the shortcomings, the UDAG that you authored.

Mr. Chairman, do not be so critical of that work and that authorization, because, notwithstanding the fact that initially, in its beginning, there were many shortcomings. I think there were many who took advantage of the program in a manner in which it was never intended.

I believe with the stripped down—and it is stripped down—reduced funding levels, it has forced, and Sam Pierce, with his leadership, has undertaken the kind of implementation of this program that really sees real dollar value. Those UDAG grants in most cases are long-term interest-free loans that leverage in many of the communities. And I think this is one of the things that we have to fight to do is to see to it that it brings jobs to areas that otherwise would not come, development in areas whether it be a very nice complex. Why should not nice complexes be enticed to come into areas where otherwise they would not, as a result of the leverage of those federal dollars?

So Mr. Chairman, we did pass a rather historic bill yesterday. We passed the Nehemiah Program, which I know the housing people, Secretary Pierce, opposed. I think there are many things he has to oppose on the record: UDAG grants, new construction for seniors. And he does that as the good soldier, as those secretaries and the administration must undertake. But I also think that in the responsibilities that he discharges on a daily basis he has done an exemplary job.

Having said that, Mr. Chairman, I have several questions on the willed funds, the pool funds. The Secretary indicated last year that these funds would be released. They have not been. I have another question which I would like to raise with the Secretary. I will do that by way of, with your permission, written questions. And I would thank you for being so patient with my opening statement, Mr. Chairman.

Senator PROXMIRE. Thank you very much, Senator D'Amato. That was an especially gracious and generous statement and a fine statement with respect to the Secretary, coming from someone who has been very critical of the fact that the Secretary has had to, as you put it, cut back on expenditures by his agency.

Senator Grassley?

REMARKS OF SENATOR GRASSLEY

Senator GRASSLEY. Mr. Chairman, Secretary, I am going to be here for only a short period of time. If you are back tomorrow, I will be here to ask some questions.

Senator PROXMIRE. He will be back tomorrow.

Senator GRASSLEY. But I am going to be here today just to say, Mr. Secretary, I appreciate very much your personal response to the inquiries I have made. You have met with constituents of mine; you have been to my state. And all I can say is I have found you totally cooperative with every request I have made. I know that everything I have requested cannot be granted, but at least your consideration of it shows me the sincerity in which you take your work.

So I want to thank you for that. This is my first time on this subcommittee. This is your seventh year in your present position. I look forward to this year and next year becoming more closely acquainted as a member of this committee with your programs as we go into greater detail.

So Mr. Chairman, I thank you very much and hope that you will understand that I cannot be here any more this morning.

Senator PROXMIRE. Thank you very much, Senator Grassley.

Senator Lautenberg?

Senator LAUTENBERG. I have no opening statement, Mr. Chairman.

Senator PROXMIRE. Mr. Secretary, you can go right ahead. As I say, you can summarize your statement. You can be assured it will be printed in the record in its entirety. We are looking forward to hearing from you. Go right ahead, sir.

SUMMARY OF STATEMENT

Secretary PIERCE. Mr. Chairman and members of the committee, I am pleased to appear before you to present HUD's budget for fiscal year 1988.

My budget request totals $10.2 billion in budget authority and $13.9 billion in outlays. In staffing, we estimate we will have 11,965 full-time employees. These estimates do not include the impact of the administration's credit reform proposal, which I will refer to later.

My budget proposals this year continue to address the dual objectives of fiscal restraint to help keep the federal deficit under control, while at the same time providing additional support for housing the needy in our society.

FAMILIES RECEIVING HOUSING ASSISTANCE

I am proud of HUD's contribution, under my direction, to fiscal responsibility. I am still prouder that, even as we have taken steps to reduce the deficit, we have increased the number of families receiving housing assistance. Since my tenure as Secretary began in 1981, we have been able to assist 1 million additional families, increasing our support from 3.2 million families to 4.2 million families.

To help shelter the disadvantaged, our 1988 budget proposes a comprehensive package of housing assistance which includes vouchers for 79,000 additional families, 1,000 additional Indian housing units, and a funding level of $75 million for the Rental Rehabilitation Grant Program.

VOUCHER PROGRAM

We have long proposed that the federal government's low-income housing assistance should be based upon a system of rent subsidies, or vouchers, rather than on new construction. Vouchers provide greater freedom for families to balance their budgets between housing and other necessities. They are doing a good job for people who need them.

Recent criticisms of vouchers fault them for doing exactly what they are supposed to do: allowing families to choose for themselves how much income to spend on housing. By introducing choice, vouchers improve upon section 8 certificates. With certificates, families may not increase their rent payments to get better housing. And if they select lower priced housing, their subsidy, rather than the amount they pay, is reduced.

The voucher program is catching on and working in all types of markets. Even in New York City, a tight rental housing market, preliminary demonstration results show that half the voucher families are finding units at rents below the program's payment standard.

As a result, the average rent burden in New York is only 31 percent of income. Before joining the program, these families were paying, on average, 60 percent of their incomes for rent. Reducing its rent burden from 60 to 31 percent is a big benefit for any family.

After the usual administrative problems in getting a new program started, many public housing agencies are now telling us what a good program it is. And each month, 3,000 new families are beginning to receive their voucher assistance.

For every 10 families issued vouchers, 6 find qualified units and start receiving assistance. This is a very high success rate for such programs. Families that turn back vouchers do so for a number of reasons. At least 2 of the 10 families probably change their mind, never using their vouchers. These vouchers do not go to waste but are issued to the next families on the waiting list.

But we can do better than 6 out of 10 by increasing the amount of rental housing that passes the program's housing quality standards. Many of the families who need our assistance live in cities and neighborhoods with basically sound housing that needs only moderate levels of rehabilitation to make it available to families with vouchers. That is why we support vouchers with rental rehabilitation, a program administered by cities, counties, and states.

I will stop here, Mr. Chairman. I think that generally summarizes our program. At this point, members of my staff and I will answer any questions your committee may have.

Senator PROXMIRE. Thank you very much. I appreciate that. It was a good, concise summary, and your statement, as I say, will be printed in full in the record.

[The statement follows:]

STATEMENT OF SECRETARY SAMUEL R. PIERCE, JR.

Mr. Chairman and members of the Committee, I am pleased to appear before you to present HUD's Budget for fiscal year 1988.

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Rental rehabilitation provides a private owner of rental housing with a grant that pays for no more than half of the cost of the rehabilitation. In actuality, private owners are raising more than half the cost.

The owner of a Rental Rehab Project must be willing to rent the units to voucher-holders, if they apply, but is permitted to rent them to people at any income level. The Rental Rehab program expands the overall supply of rental housing available to low-income families, without forcing assisted tenants to live in projects the Government has chosen for them.

The low-income housing tax credit is another new tool we have for expanding the supply of affordable rental housing. The tax credit is 9 percent of the depreciable cost basis of low income units each year for 10 years, if it is used for new construction or rehabilitation; and 4 percent of the depreciable basis, if it is used for acquisition of existing housing projects. Depending on how States allocate their pools of tax credit authority, among new construction, rehabilitation, and acquisition, the number of rental housing units made or kept affordable to house poor people could range from 55,000 to 200,000 or more every year.

In some special circumstances, subsidized new construction of rental housing may be necessary, either for housing markets with difficult supply problems or for types of families with special needs. Therefore, our FY 1988 Budget includes a proposal to make the new construction of housing eligible for CDBG funding. While new construction is currently eligible in limited situations, this amendment would give communities a full range of options in using CDBG funds to meet local housing needs.

In addition, although most low-income elderly and disabled have problems of housing affordability...rather than availability...in some circumstances this is not the case. Therefore, I propose a limited amount of funding for the Section 202 program to support 2,000 additional units.

I would like to discuss with you our proposals for FHA Mortgage Insurance Programs. Over the past 50 years, FHA has enabled millions of Americans to buy a home. I want to strengthen FHA and target it to those families not adequately served by the private sector: first-time, rural and inner-city homebuyers.

We propose several legislative initiatives to help us better serve these families.

First, we propose that single family insurance be limited to people who will live in the homes they buy. Not only do investor loans represent a disproportionate share of FHA's defaults and claims, but the program has been subject to widespread fraud and abuse. In addition, since FHA-insured single-family rental homes comprise less than 5 percent of the total single-family rental inventory, the program no longer can be justified. We also propose raising the minimum downpayment for families with incomes above $40,000 by a small amount (generally not more than $500) to minimize the risk of default on these loans.

The total limitation proposed for FHA commitments for FY 1988 is $79.3 billion. This would be reduced by $9.3 billion, to a level of $70 billion, if legislation is enacted for the premium fee increase and for restrictions on use of the FHA program.

For GNMA's Mortgage-Backed Securities program, I am requesting a limitation of $100 billion for commitments issued. This is based on anticipated mortgage and loan insurance activity under the FHA and VA housing programs.

The 1988 Public and Indian Housing budget proposes $1 billion for capital costs to continue modernizing viable projects. Of this funding, $563 million is in the 1988 Appropriation request, and $437 million would be shifted from the 1987 Appropriation. This funding shift would leave $1 billion available for capital costs in 1987, as well. Since financing of this program is now on a capital grant basis, the proposal is the equivalent of $2 billion of budget authority for debt service under the prior amortized loan method.

The 1988 Budget includes $71.5 million for an additional 1,000 new Indian Housing units.

While no new public housing construction is proposed, about 4,500 Public Housing units will be completed and become available for occupancy in 1988. This projection is based on about 18,000 Public Housing units expected to be in the pre-construction and construction pipelines at the beginning of 1988.

We also are requesting an appropriation of $1.4 billion for 1988 for Operating Subsidies to support the operation of Public and Indian Housing projects. Along with $85 million of 1987 excess funds that we have requested be reappropriated in 1987 for use in 1988, this amount should fully fund all requirements.

Approval of our request for $18.9 million for research will allow us to focus on ways to develop more cost-effective strategies to improve the rehabilitation of Public Housing and other multifamily housing. We will focus on improving the quality of life for Public Housing families and promoting efficient management of HUD's multifamily housing programs. Other major efforts focus on ensuring a supply of affordable rental housing; monitoring and evaluating tax policy and its impact on homeownership and rental housing; and maintaining the stability of the housing finance system. Our research plans also call for enhancing homeownership opportunities through the design of sound mortgage instruments and improvements in existing FHA programs; increasing compliance and enforcement of Fair Housing laws and developing new strategies to promote fair and nondiscriminatory housing; and continuing to monitor the use of Federal tools for State and local economic development strategies.

In the area of Community Planning and Development, we will continue our efforts to concentrate Federal resources on national priorities and to provide maximum opportunity for State and local governments to meet their own local community and economic development needs. To achieve this, the comprehensive and flexible Community Development Block Grant program will continue to be the principal vehicle for Federal support.

We are recommending a funding level of $2.6 billion in 1988 for the CDBG program. This amount includes estimated new budget authority of $2.5 billion and the transfer of an estimated $115 million end-of-year unobligated balance from the Section 312 Rehabilitation Loan Fund. The small decrease from the fiscal year 1987 Appropriation is part of our effort to reduce the Federal budget deficit.

The block grant is based on the principle that recipients are responsible for selecting eligible activities most appropriate to their local circumstances. Consistent with this principle, legislation is being proposed to increase local flexibility and to eliminate unnecessary costs to the Federal Government.

We propose a funding level of $47 million for the Secretary's Discretionary Fund in 1988. These grants support the Community Development activities of Indian tribes and insular areas, and provide technical assistance to States and units of local government in making the most effective use of their CDBG funds.

As we mentioned earlier, the President's Budget proposes a funding level of $75 million for the Rental Rehabilitation Program in 1988.

An appropriation of $12 million is proposed for the Urban Homesteading Program in fiscal year 1988. At an average cost of $18,000 per unit, we expect this funding level to support the transfer of approximately 665 properties to homesteaders. This program assists communities and individuals to acquire properties as part of a strategy of neighborhood improvement through the upgrading of community services and facilities.

The need to reduce the Federal deficit while preserving the Administration's spending priorities makes it necessary to propose several terminations. One is for the UDAG program, which I have long supported, but which the Administration has determined should end, along with other local economic development programs. These include the Department of Commerce's Economic Development Administration, the Appalachian Regional Commission, and direct support to TVA's Regional Economic and Community Development programs.

I believe UDAG has proved successful. It has built local economic development capacity and cultivated closer working relationships between local government and local business, which have made many communities better able to address their local economic development challenges. However, the acute need to resolve our Nation's very serious deficit problem has caused the Administration to recommend termination of this program.

We also propose terminating the Section 312 Rehabilitation Loan program because the CDBG and Rental Rehabilitation programs are more effective and flexible and less expensive. Terminating the Section 108 Loan Guarantee program is recommended because of the limited demand for the program.

Fair housing continues to be a top HUD priority. The Federal Fair Housing Law of 1968 established the basic rights of persons to be free from discrimination in housing because of race, color, religion, sex or national origin. In spite of this law, the goal of equal housing opportunity remains for many a dream more than a reality.

Recent evidence indicates that housing discrimination remains a pervasive and increasingly sophisticated feature of American society. The elimination of discrimination in housing requires strengthening and coordinating all fair housing enforcement and compliance efforts.

The Budget I propose today is designed to enhance a comprehensive fair housing strategy which will include assistance to State and local fair housing agencies, housing industry groups and private organizations. As a further part of that strategy, we will again offer amendments to strengthen Title VIII of the Federal Fair Housing Act.

The Budget includes a request for $10 million in 1988 to operate two related programs to combat discrimination in housing.

For the Fair Housing Assistance Program (FHAP), I am requesting $6.4 million, with $4 million to be used to fund State and local agencies that have fair housing laws substantially equivalent to the Federal Fair Housing Law. This amount includes $1 million for community housing resource boards to continue developing, implementing and monitoring voluntary affirmative marketing agreements with housing industry organizations throughout the Nation.

For the Fair Housing Initiatives Program (FHIP), I am requesting $3.6 million. In addition, $1.4 million of FHAP funds would be transferred to FHIP upon its enactment. We continue to seek and support this important program, which is designed to increase public and private participation in the Nation's effort to end discrimination in housing. Under FHIP, HUD would assist State and local government agencies and public and private organizations to implement programs to prevent or eliminate discriminatory housing practices. This assistance would enable recipients to carry out activities designed to obtain enforcement of the rights granted by the Federal Fair Housing Law, or by substantially equivalent State or local laws. It also would enable them to undertake education and outreach activities to curb discrimination in housing. The public/private partnership envisioned in FHIP will signal a more aggressive and coordinated strategy to combat housing discrimination, and I am optimistic about Congressional approval this year.

As I mentioned earlier, the Administration has proposed legislation to reform the way Federal credit programs are managed. This legislation would require inclusion in the budget of the Federal subsidies incorporated in direct loan, insurance, and guarantee programs. Budget amendments were recently sent to Congress that included a request for $2.5 billion in subsidy costs for several HUD programs, including, FHA, GNMA's Mortgage-Backed Securities Program, and the Section 202 Program for the Elderly or Handicapped. A new Federal Credit Revolving Fund would be established within the Department of Treasury to make loans and guarantees, based on subsidy payments that HUD makes to the fund. A more complete description of this proposal and its effect on HUD programs is in the separate Budget Amendment Justifications which we have given the Committee.

Finally, I am requesting $661.2 million for 1988 Salaries and Expenses. Funding increases are required to support the first full year of the new Federal Employees Retirement System, to fund anticipated GSA rent increases, and to expand data processing and contractual services.

Now I will be happy to respond to any questions the Committee may have concerning our 1988 Budget proposals.

2-YEAR BUDGET CYCLE

Senator PROXMIRE. Mr. Secretary, Senator Domenici has suggested we explore the possibility of passing 2-year appropriation bills. Would that approach create any particular problem for your Department, or do you see a benefit in having to justify your budget only once every 2 years?

Secretary PIERCE. No; I think it would be very good to have hearings only once every 2 years. [Laughter.]

Senator PROXMIRE. We have more hearings than that. We enjoy your company so much and there is such an interest in it that it would not cut down on that.

Secretary PIERCE. I understand. That is something that is being pushed very much by the President and other members of the administration.

Senator PROXMIRE. What proportion of your annual appropriations request would you consider simply repetitious of the previous year's submission?

Secretary PIERCE. That is very difficult. Let me ask my finance man. Maybe he can tell you better than I can.

Mr. KLIMAN. Nothing is an exact repetition, Mr. Chairman. Many of the proposals that you have found in this year's budget are indeed proposals that have been made in prior years. But the numbers are different and there are a number of proposals that are substantially different, as well. It is really impossible to put a percentage on it. You find a large degree of policy repetition, but I would say not more than half is exactly the same.

Senator PROXMIRE. At any rate, there is a sufficient amount of repetition so that there would be a substantial savings in not having to have an annual budget.

Mr. KLIMAN. It could certainly save a lot of time and a lot of people and, perhaps, make the process go faster.

Senator PROXMIRE. Let me ask you gentlemen: What difficulties, if any, can you foresee in preparing and submitting a 2-year budget?

Secretary PIERCE. I do not believe we would have any problems.

Senator PROXMIRE. Would you expect to realize any specific budget saving if you could plan your agency budget on a 2-year basis? I know it is very difficult, as Mr. Kliman says, to put a percentage on this, but could you estimate how much of a saving, 10 percent, 5 percent, whatever?

Secretary PIERCE. I would think that up to about 10 percent. I do not think much more than that.

HOUSING VOUCHERS

Senator PROXMIRE. Secretary Pierce, you are requesting a total of about $4 billion for annual contributions for assisted housing, a reduction of $3.8 billion in your current appropriation. Under your proposed budget, the bulk of new unit reservations would be allocated to housing vouchers, and you devote a substantial proportion of your opening statement to the voucher program.

Five-year vouchers would account for 79,000 out of a planned 100,000 unit reservations in 1988. On the other hand, you have no plans to continue with the section 8 15-year certificate program.

I understand you are undertaking a 5-year evaluation comparing the benefits and costs of housing vouchers with section 8 certificates. What have been some of the preliminary findings of the ongoing evaluation of vouchers versus certificates?

PRELIMINARY EVALUATION OF VOUCHERS

Secretary PIERCE. Our evaluation program is still going on, but we are finding some very interesting facts. For example, in New York City we find that the amount paid from a person's income, whether that person has a voucher or a certificate, is the same. It is 31 percent. In other parts of the country it is somewhat different, but it is very close.

When that study gets fully completed, we certainly will submit it. But the big advantage I see with the voucher is that it is portable and families have the right to shop around to find where they want to live. They can pay more or less for the place where they want to live.

Senator PROXMIRE. You gave that 31-percent average on the voucher payment, which is impressive. But as I understand it, in New York City voucher recipients are paying between 11 percent and 60 percent of their income for rent. Does that inequitable distribution of rental burdens not bother you, that difference?

Secretary PIERCE. No; because it is a matter of choice, if you are talking about the voucher. It is a matter of their choice. We are talking on average, it is 31 percent in New York, but if they want to they can pay more or they can pay less. So that is where you get these big variations.

Senator PROXMIRE. Nevertheless, in spite of the fact that it is a matter of, I suppose, choice, I would think that that choice must be a pretty grim choice if people are willing to pay as much as 60 percent of their incomes.

Secretary PIERCE. Why don't I have Dr. Koch, whose organization is actually looking into this, talk about this, because they are actually making a study.

Senator PROXMIRE. Dr. Koch, would you come forward?

NEW YORK STUDY

Dr. KOCH. Thank you, Mr. Chairman. We are reviewing the New York study. It is not, as you probably know, a final study; it is a preliminary study. So we do not at this point have sufficient information to gauge what the higher percentage of rent to income actually means, whether the tenants are getting a great deal more housing or in more adverse circumstances. So we are looking to receive more data on that.

All we have now is the general data. The general data is not unfavorable, as Secretary Pierce pointed out, in regard to the average percentage of income paid for rent by voucher holders in New York.

From our own study of vouchers, what has come in is an interim report which is now being revised and finalized. It indicates, as the

Secretary has pointed out, that in the locations where we are doing the voucher demonstration, the percentage of income paid for rent for vouchers is, on average, similar to the percentage of income paid for rent in the Certificate Program.

As you may recall, we are doing this side by side, comparing certificate usage with vouchers. People are paying about 31 percent of income under certificates and about 34 percent under vouchers. We do not and will not have until next year the data on what this means in terms of housing quality.

One important thing that has come in is that the percentages of both certificates and vouchers being used by the first family who receives them are higher than any of the percentages under the Experimental Housing Allowance Program and all the evaluations we did in past years on certificates. It was about a 50-percent usage under EHAP. Now it is about 60 percent.

The other thing we know is that this 60-percent success rate is equal for the two programs. Those who are getting certificates and those who are getting vouchers are renting at the same rate of success. That is about what we have now from the data coming in.

Senator PROXMIRE. As I understand it, Mr. Secretary, you will be before us again tomorrow; is that correct?

Secretary PIERCE. Yes.

Senator PROXMIRE. Perhaps you would like to come in tomorrow and give us a little more detail or perhaps you can provide that for the record and also give us an oral presentation on it, because that does seem to be quite a discrepancy.

Dr. KOCH. Surely.

COMPARATIVE SUBSIDY COSTS

Senator PROXMIRE. Mr. Secretary, a study conducted by the New York City Housing Authority showed that the average subsidy paid for 93 voucher rentals was $252 while the average subsidy paid for 98 certificate rentals was only $209. Does that indicate that the Voucher Program costs the American taxpayer more than the Certificate Program?

Secretary PIERCE. No; I do not believe so.

Dr. Koch, I think you had better stay here. You have been working on all of this.

Dr. KOCH. I will submit tomorrow for the record the details on this. But there is a discrepancy that is peculiar to New York that has to do with the way welfare payments are calculated in regard to housing certificate payments. That discrepancy raises the amount of voucher subsidy comparable to the certificate subsidy. I will submit the details for the record.

[The information follows:]

Comparison of Calculation
for Voucher and Certificate Payments
in New York City

There are several States, including New York State, which have State legislation under which local welfare departments identify some portion of the Aid to Families with Dependent Children (AFDC) payment to a family as an adjustable "welfare shelter allowance." In such "as-paid" States, the welfare shelter allowance is adjusted to a family's actual shelter cost. Thus, if a family finds a housing unit that requires a smaller rental contribution than the amount of the welfare shelter allowance, the welfare department reduces the shelter allowance to the amount of the actual rental contribution.

The statutory language governing the Section 8 Certificate program requires that the PHA set the tenant's rental contribution at the maximum of 30 percent of adjusted income, 10 percent of gross income, or the shelter allowance permitted by the State law governing the AFDC program. No such legislation has been enacted with respect to the Section 8 Voucher Program.

The Voucher statutory language amends Section 3 of the United States Housing Act of 1937 to exempt the Voucher Program from the rent to income requirements, and establishes tenant contributions for the Voucher Program that do not take into account the provision for "as-paid" States.

In many "as-paid" States (including New York), our study indicates the maximum AFDC shelter allowance is much higher than 30 percent of the typical AFDC family's income.

Therefore, even if the certificate family and the voucher family are identical in every other respect, the certificate family's tenant rental contribution is more and the subsidy is less, while the voucher family's tenant rental contribution is less and the subsidy is more. An example is shown in the following tabulation.

	Certificate Using AFDC Shelter Allowance	Voucher Using 30% of Income
Rent	$400	$400
30 percent of income	[120]	-120
AFDC shelter allowance	-200	NA
HUD subsidy payment	200	280

In this example, the HUD subsidy is $80 higher under vouchers than under certificates, because of the difference in the way tenant contribution is calculated for families receiving AFDC shelter allowances.

USE OF VOUCHERS IN TIGHT RENTAL MARKETS

Senator PROXMIRE. The voucher program, Mr. Secretary, assumed that poor families have substantial freedom of choice in renting housing units. However, that freedom may be illusory in tight rental markets, especially since we are talking about consumers with a pretty low level of sophistication.

Let me give you an example of what I mean. This is taken from a memorandum Chairman Gonzalez sent to the Democratic members of the House Subcommittee on Housing and Community Development. It indicates how landlords can manipulate rents under the voucher program:

> In one case, a 74-year-old single person, occupying the same apartment since 1971 rented "in place" with a section 8 certificate. The landlord asked for an increase in rent from $190 to $400. The PHA rent reasonableness analysis permitted an increase to $217. The landlord accepted that rent.
>
> In contrast, a three-person family occupying the same apartment since 1979 rented "in place" with a voucher. The landlord immediately raised the rent from $250 to $500. Since the landlord knew the voucher subsidy was $250, the landlord notified the family that their share of rent would not increase.
>
> Since the PHA could not apply the "rent reasonableness" test to the rent charges, then the federal voucher subsidy provided the landlord with a windfall and the family's rent burden was not reduced.

Does that indicate that your Voucher Program may not be working as well as it might seem?

Secretary PIERCE. No; I would not say that at all, because from information that we have received, we have found that the Voucher Program has actually kept landlords in line. They are trying to get people who have vouchers to come into their buildings, and it is causing competition. And because of competition in trying to get people into their buildings, they are going down on their rent instead of up on their rents.

As I say, when we complete our study, we will have much more to say about that. Dr. Koch is here, and she can say more because they are actually studying it.

Do you have anything to add?

Dr. KOCH. We do not have any data on that type of rent increase from what is coming in. That, of course, would be anecdotal data that describes that kind of incident.

Senator PROXMIRE. The kind of incident that I described with $250 with the taxpayer being the fall guy?

Dr. KOCH. Yes; I would like to review that carefully and compare it with our data. As I say, it is only anecdotal data.

Senator PROXMIRE. It is anecdotal, but it seems that there is such an incentive here, in view of the fact that the landlord is better and the tenants no worse off, that I would think it might be a fairly common abuse. At any rate, maybe tomorrow you can give us a more detailed response to that.

I think my time is just about it. Senator Lautenberg came in before the other Senators; however, the ranking member of this committee and the former chairman is here, Senator Garn, my dear friend.

Senator Garn, do you have an opening statement?

Senator GARN. No; I simply would like to welcome the Secretary and thank the chairman for his courtesy. One of the advantages of being chairman, which I wish I still had, is not to have to committee-hop. But I just came from Energy and Water. There are three subcommittees for appropriations meeting all at the same time. When you are not chairman, you do not have an excuse for not attending all of them.

I wish to welcome you here. I am going to leave and Senator Lautenberg can proceed, and I will go to my third appropriations subcommittee. Thank you, Mr. Chairman. [Laughter.]

Senator Lautenberg?

Senator LAUTENBERG. Mr. Chairman, did you say that Senator Garn is your friend and, therefore, you would call on him first? Does that mean that I am not your friend? [Laughter.]

Senator PROXMIRE. I said he is the ranking member. You are both my dear friends, I hope.

Senator LAUTENBERG. Thank you, Mr. Chairman.

Mr. Secretary, you are aware of the chairman's interest in this subject because he had many options with his seniority as to which subcommittee he chose to chair, and he chose this one. So that is a testimony to the interest that you and he share in this subject. Of course, you know we have been together before, and I obviously have a deep interest in what takes place in your Department.

RADON GAS

The subject I would like to discuss today is something called radon gas. Is the material familiar to you, Mr. Secretary?

Secretary PIERCE. I know a little about it. I do not claim to be an expert, by any means.

Senator LAUTENBERG. We have all, especially in my area in New Jersey, become experts on the subject. It is a very threatening material thought to cause as many as 20,000 to 25,000 lung cancer deaths a year. It is believed to be the second leading cause of lung cancer deaths in the country, just behind cigarette smoking.

CDC, the Center for Disease Control, says that 6 million people across our country are exposed to dangerous levels of radon gas. The material has been found throughout the country, in at least 45 states. It is being found in all kinds of construction: single-family homes, apartments, schools, et cetera.

TESTING FOR RADON

Each year, HUD supports thousands of housing units through loan subsidies and grants. Yet HUD does not require radon tests for funding projects. HUD does not seem to have a specific plan for dealing with the problem.

Are you aware of whether or not the Department does have any regulation on radon? It is my understanding that there is not any. The record should stand subject to contradiction if that is the case.

Secretary PIERCE. Let me ask the people in Housing.

Mr. DEMERY. Not that I am aware of.

Secretary PIERCE. No; apparently not.

Senator LAUTENBERG. HUD did have a policy of testing homes at one time in Montana.

Senator PROXMIRE. Pardon me, Senator Lautenberg.

Would you identify yourself, please?

Mr. DEMERY. I am Tom Demery, the Assistant Secretary for Housing.

Senator LAUTENBERG. Mr. Demery, HUD did have a policy of testing, or at least an involvement in testing, homes in Montana and apparently abandoned that practice after that review. Are you aware of that?

Mr. DEMERY. No; I am not. Was it replaced by a state test?

Senator LAUTENBERG. In that case, it may or may not have been. EPA has now taken over the responsibility on a national basis for providing information and for making certain that people are aware of the danger.

However, in this case, HUD is directly involved in either subsidy or mortgage through FHA, some direct involvement it has to take in the properties, obviously. So if HUD subsidizes a housing project and then 3 years down the road it is found to be contaminated—you are familiar with radon?

Mr. DEMERY. In general I am; yes.

Senator LAUTENBERG. So if there is a housing project that is subsidized by HUD and then the radon material is discovered, what happens? Do we say to people, look, take the risk, this, after all, is government housing and you have got to deal with your health as you can? Or do we talk about the possibility of closing down the facility, mitigating against the threat?

Some of it can be fairly expensive to deal with; some of it is fairly simple in single-family homes. You can often just simply ventilate with a basic fan system.

EPA RADON RATINGS

Mr. DEMERY. It is my understanding that EPA does establish radon ratings in various states and communities affected by this problem. Where we are aware of a problem that exceeds the EPA rating, we do require special and additional tests before we do proceed with insurance. So while every situation is not tested, we are relying on EPA figures and data to guide us a little bit.

Senator LAUTENBERG. But you said earlier, Mr. Demery, that you do not have a national regulation on this material.

Mr. DEMERY. That is correct; yes. EPA does.

Senator LAUTENBERG. The discovery was made in 1973 that among many buildings in Grand Junction, Colo., HUD had an active interest in many, including a 100-unit public housing facility, two junior college dormitories, a seniors' home, and a number of FHA-insured homes. That was in 1973, and that area was where a lot of uranium mill tailings were deposited.

We are here quite a number of years later. And on March 7, 1986, Assistant Secretary Moran sent a memorandum to HUD's regional administrators dealing with radon. I will read to you from the summary section of that memo.

RADON GUIDANCE REPORT

It says:

> The Department intends to publish guidance concerning radon for use by states, local entities, contractors, developers, planners, and the general public. The intent is to provide specific simple, effective, and low-cost remedial and mitigation methodologies and procedures to make existing and new houses impervious to radon concentration.

A couple of sentences later, it says:

> It is anticipated that such guidance will be forthcoming during the latter half of 1986.

[The information follows:]

> The referenced document (on p. 6) qualifies the preparation of guidance and also states that "The Department is purposely withholding publication until remedial and mitigation measures have been demonstrated to be effective." HUD uses reports published by other agencies with active radon programs. Several major issues need to be resolved including (*a*) establishment of a standard for the maximum radon level for housing; (*b*) methodology for surveying broad areas of potentially high radon levels; (*c*) methodology for predicting radon levels at a specific site; and (*d*) development and testing of low-cost preventive and remedial measures to reduce radon levels in new and existing residential structures.

Senator LAUTENBERG. As far as we have been able to tell, HUD has not issued that guidance report. Is that true?

Mr. DEMERY. Yes; that is true.

Senator LAUTENBERG. Can you tell me why, if it was essentially a Department directive, going back that late, that this has not happened?

Secretary PIERCE. I do not believe that was a Department directive. That was something that Mr. Moran issued.

Senator LAUTENBERG. Let's not quibble about language. Mr. Moran, who was Assistant Secretary——

Secretary PIERCE. And he left and apparently did not do it.

Senator LAUTENBERG. So I guess we ought to accept it like that and say, well, it just did not happen.

I would urge, Mr. Secretary, that when there is something like this that instructs or believes that this is an important problem to deal with that if memoranda are not going to mean that an action is going to follow, maybe we ought to have a collection of those that are not required to really be followed up on.

It seems to me that it is pretty important, and I am not satisfied, Mr. Secretary. I do not want to engage you in an argument here, but the fact that it just is not done is not a very satisfactory answer.

Mr. DEMERY. While I am not able at this moment to respond specifically to that exact question, because I am just not that familiar with that issue, sir, I will tell you that I will meet with Mr. Moran's replacement and discuss that aspect of that memorandum to find out what work was needed outside of, for example, HUD, to generate data. For example, if he was relying on certain information and guidelines to be established by EPA to perfect what he wrote in that memo—and I am not saying that he did or did not—I just do not know at this point enough to be able to affirmatively respond as to why.

I do not want to leave with you, however, the impression that we are not sensitive to this issue and that we plan on ignoring what was written. I just at this moment cannot tell you the instructions that Assistant Secretary Moran referred to have not gone out.

Senator LAUTENBERG. Under Superfund amendments, HUD is directed to work with EPA on the radon problem. It is my understanding that an agreement has been reached between HUD and EPA. Do you know whether that is true or not?

Secretary PIERCE. Excuse me. I would like, Senator Lautenberg, to have a man who was working directly under Assistant Secretary Moran talk to you about this, because he, probably more than anybody else here, would know about what was the plan and why they did it, why they did not do it, et cetera. I think he can explain this.

Senator LAUTENBERG. Your name, sir?

Mr. STOKVIS. My name is Jack Stokvis. I am the General Deputy Assistant Secretary for Community Planning and Development. As you know, Senator, the question of radon is a very difficult one to solve. Those tests you cited in Montana were done using an analysis of the indoor air by a method called a grab sample, but they could be compromised by opening the window. As a result, the value of most of the tests using this particular technique on radon has been very iffy.

Senator LAUTENBERG. I cannot permit you to conclude that. I have been very involved in the radon problem, and you cannot say most of the tests are iffy. Can you get around them? Yes, it is possible.

There is a very reliable testing mechanism network that is out there, sponsored by universities, Pittsburgh and various others. You can say in that case that people who did not want to have tests give a true reading could, perhaps, open the window and ventilate the building. But there are reliable tests. And, of course, the danger is when the windows are closed.

Mr. STOKVIS. I agree with what you have said. But what I mean to say is that the particular tests in Montana were easily circumvented by individuals, and we found in HUD's analysis of those tests that this happened quite regularly.

In addition, one of the things that has compounded the radon problem is the superinsulation of housing. You did not have the magnitude of the radon problem that you do have now. Previously when the units were not sealed so tightly, there was more natural ventilation and the level of radon was much less and not considered a major health issue.

I would like to provide to you and for the record a list of all of the things that HUD has been doing on the radon issue. My office has an office that handles this and coordinates it with Mr. Demery, other offices within HUD, and other agencies, and we have done a lot. We have had orientation programs for our people in the regions. We have had a lot of outreach on dealing with the radon issue.

[The information follows:]

HUD ACTIVITIES WITH RESPECT TO RADON

—HUD is actively involved in interagency programs: Committee on Interagency Radiation Research and Policy Coordination [CIRRPC], National Council on Radiation Protection and Measurements [NCRP], and the Interagency Committee on Indoor Air Quality [CIAQ] radon panel.

—HUD has long-standing involvement in the federal remedial program under the Uranium Mill Tailings Act.

—HUD is tracking, reviewing, and proposing actions/demonstrations for other federal efforts, EPA, Interior, DOE (including the Bonneville Power Authority).

—HUD is tracking state efforts in those states with active radon programs such as New Jersey, Pennsylvania, and Florida. Meetings have been held with key state officials and real estate interest in selected states such as New Jersey to determine the extent of their interests and programs.

—HUD has been serving as a catalyst in the Florida demonstration for building slab and crawl space housing on reclaimed phosphate lands. There are no federal funds in the demonstration. Results are expected in June 1987.

—HUD is monitoring other federal agencies and state radon programs.

—HUD is in the process of developing a policy on this issue related specifically to HUD assistance programs. As part of the policy formulation, HUD needs to determine potential liability.

—HUD will continue to work on the interagency efforts and strive to obtain the necessary information and techniques in order to establish a Department position.

—HUD will work with EPA on indoor air quality (and radon) as required by Superfund Amendments and Reauthorization Act of 1986 [SARA].

Senator LAUTENBERG. My time is up.

Mr. Chairman, it is confirmed that the Department is going to be back tomorrow?

Senator PROXMIRE. Yes, indeed, tomorrow.

Senator LAUTENBERG. If you would kind of brush up on that, because I would like to continue with this.

Secretary PIERCE. He can bring his material with him.

Senator LAUTENBERG. Thank you very much.

Senator PROXMIRE. Senator Nickles?

PROPOSED NEHEMIAH PROGRAM

Senator NICKLES. Mr. Chairman, thank you very much.

Mr. Secretary, I welcome you to this committee. I also want to thank you for your prompt letter that you gave me concerning the Nehemiah Program that was passed. I remember the vote was close to strike that section.

Would you, for the record, give us—and you can do this orally or possibly for the record—your reasons for opposing the creation of the Nehemiah Program?

Secretary PIERCE. Basically, it is aimed at helping people of median income. It involves second mortgages without any interest. We feel at a time when we are trying to reduce the budget deficit, Nehemiah is something we can do without.

We have to think of which programs we want to cut or get rid of, and that is one we decided not to support. Of course, we did not originally create the program.

Senator NICKLES. It is one that we do not have, so it is a creation of a new program that we are looking at. You mentioned a no-interest loan.

It is also a no-principal loan. In other words, no payment would be made. You would be making $15,000 grants that would be repaid if the unit is sold or transferred and if there is any money there, since all you have is a second mortgage.

Anyway, I appreciate your response to the letter. I might ask you, too, in comparison, in looking at your statement, you talk about the success of FHA. But is not the FHA program a lot more successful and have a lot greater capability of helping those on the lower end of the economic scale because, one, it requires a 5-percent down payment instead of a 10-percent requirement, as proposed by the Nehemiah Program?

Secretary PIERCE. I think FHA does touch people with incomes below those covered in Nehemiah.

Senator NICKLES. And is it not working?

Secretary PIERCE. We think it works well. We think FHA is most important and without FHA, housing would not be what it is in this country. In the last few years, I think people in the housing industry would tell you, they would not have had the building boom they enjoyed without FHA.

Senator NICKLES. With FHA, you have a situation where you have a first mortgage, so the federal government and the repayment record has been quite successful. I would think the repayment record under the Nehemiah Program with the second mortgage—and time will find out—will not be very good, I expect, that supporters of this program will be coming and asking for very large appropriations to initiate this new program.

I do not know exactly what those figures are, but I have heard $100 million or something in that neighborhood to get this program started. I would suggest we can ill afford that.

BUILDING NEW HOUSING VERSUS USING EXISTING HOUSING

Mr. Secretary, let me make mention: I have read your statement during the questioning by the chairman and Senator Lautenberg. You talked quite a lot about vouchers and about rental rehabilitation and so on. I would like for you to know that there are a lot of projects that are still going on that are new projects, in some cases in some communities that the communities have opposed. I say the communities; I am talking about possibly the city councils, the mayors, whatever.

Yet the projects have gone ahead and the projects have gone ahead when there is a surplus of housing. Certainly in my opinion, I would think the government could get a lot better deal for its money by doing rental rehabilitiation or fixing up some homes in existing structures. We have in many areas of the country surplus housing, surplus housing in this income range, that could be used, in my opinion should be used, prior to construction of a massive project, in many cases again, which is opposed by large segments of the community.

Do you not think that would make more sense to go in and possibly purchase existing units, fix them up if necessary, instead of creating new projects? I will give you an example. In one case in an area that I am familiar with, they are going to pay $25,000 before they begin constructing the unit. That is just for land acquisition and preparation cost. You can buy a home in my state for $25,000. Yet they are paying $25,000 for the preparation of the site before they even pour concrete.

Again, I just question the use of federal dollars in that kind of a manner. Do you have any comment?

Secretary PIERCE. That is one of the things we say when we give our great support to vouchers, because we think the problem in a lot of areas is one of affordability and not availability. People can find places to live and they just need a little help to do it. That is why we go in that direction instead of building new housing. I think building new housing is a waste of money.

Senator NICKLES. How many new units do you have in the budget now?

Secretary PIERCE. I understand we have 1,000 Indian units and 2,000 202's.

Senator NICKLES. How many did Congress mandate last year?

Mr. KLIMAN. Senator Nickles, what the Congress did for 1987 was to provide us with 2,500 Indian housing units and some 12,000 section 202 housing for the elderly units. In addition, the Congress provided a lot of money to be used for public housing, either for reconstruction or new development, depending on applications by public housing authorities. We do not know exactly how many units that will provide, probably in the neighborhood of 2,000 or so, but that is a guess right now.

CUMULATIVE HOUSING OBLIGATIONS

Senator NICKLES. Let me ask you a question. I heard Senator Armstrong mention this not too long ago. Possibly if you would give it to me or provide it, it would be appreciated. He had a chart or just made a comment about the total commitment that the federal government has made in housing in billions of dollars over the last many years, what portion of that has been expended and what portion of that is still committed. Those are astronomical figures. Would you happen to have those now or could you provide them for us possibly tomorrow?

Mr. KLIMAN. I can get them in 2 seconds.

What we are talking about are the unfunded balances of obligations in the housing programs, what the Secretary has referred to many times as housing debt. The actual at the end of 1986 was some $225 billion. At one point in time, it was up to $244 billion. It has been going down over the years. We expect that it will be down under $200 billion by the end of fiscal year 1988.

Senator NICKLES. What were the total obligations that we started with? What was the grand figure? Evidently we were up to, what, $400 billion or something, and the payments have been made?

Mr. KLIMAN. What I do not have is a figure representing the cumulative obligations that were made since the beginning of the program. It would be a massive amount, probably a half trillion dollars or so, but I would have to get that for the record.

Senator NICKLES. I am not trying to put a lot of work on you, but if you could provide that, that would be appreciated.

Mr. KLIMAN. It will be a little bit of work. I cannot have it by tomorrow.

[The information follows:]

HUD'S COMMITMENT TO HOUSING

Gross obligation data are not available. Prior to 1981, the Department's records were maintained on a net basis—net of recapture.

Through the end of fiscal year 1986, the Department has disbursed a total of $74.4 billion on behalf of assisted housing beneficiaries. When combined with an unexpended balance of $237.1 billion at the end of 1986, the Department's net commitment to housing has been over $300 billion:

Subsidized housing: Expended and unexpended balances of budget authority

[Dollars in billions]

Unexpended balance (as of 9/30/86)	$237,133
Subsidized housing expenditures through 9/30/86	74,386
Total assistance	311,519

Senator NICKLES. If we did not start another unit—and correct me if I am interpreting this incorrectly—we would still owe $225 billion over many years to fulfill the commitments that have already been initiated.

Mr. KLIMAN. That is correct, sir.

Senator NICKLES. That is a quarter of a trillion dollars. In annual, that would be about how much?

Mr. KLIMAN. We would pay it out at a rate of some $10 billion to $15 billion a year.

Senator NICKLES. And that is in your budget for 1988 and 1989 and so on?

Mr. KLIMAN. Yes, sir.

Senator NICKLES. And that annualized figure to amortize that existing obligation is how much?

Mr. KLIMAN. It would be in the neighborhood of $10 billion to $15 billion. I could precise that up for the record.

Senator NICKLES. I think it should be, because some of us are on the Budget Committee as well and we are trying to make some tough decisions right now. As a matter of fact, we are in a markup right now on the budget, and I am interested in knowing what that figure is. It is to retire our existing obligations that we could not get out of. If you could provide that, I would appreciate it.

Mr. Chairman, thank you.

[The information follows:]

SPENDOUT OF HOUSING PROGRAM UNEXPENDED BALANCES

The Department expects to disburse $10.1 billion in payment of housing assistance obligations during fiscal year 1988. The furthest we have projected to is fiscal year 1992 when $12.7 billion of housing payments are expected to be disbursed.

REGULATIONS ON HOMELESS RELATED TO RELIGIOUS GROUPS

Senator PROXMIRE. Senator Mikulski?

Senator MIKULSKI. Thank you, Mr. Chairman.

Mr. Secretary, some of my questions will focus on the issues related to the homeless. One of the first areas that I would like to cover regarding meeting this very challenging issue is the HUD regulations on the establishing of religious groups to get federal money to aid the homeless.

Last December, your agency proposed regulations that would prohibit religious organizations from receiving federal funds to adopt properties owned by those groups into shelters. Have those regulations proceeded, and what is their status? Also, what was the rationale behind them?

Secretary PIERCE. Our general counsel will discuss this.

Would you give your name for the record?

Mr. DORSEY. My name is Michael Dorsey. I am general counsel with HUD.

Senator Mikulski, the answer to your question is that those regulations were issued in proposed form. We have just received comments on precisely the issue you are raising. We are studying those comments and will be issuing the final regulation as soon as we can, giving due consideration to the comments that have been made.

The basis for the decision to issue the regs the way they were was a concern about the first amendment and the separation of the church and state. As we understand it, the real issue is repairs, modification, to churches.

Senator MIKULSKI. To churches or to buildings?

Mr. DORSEY. To church facilities.

We do not have any problem and the regulation is written to allow expenditure of funds for the programs, even if the program is operated in a church basement or in a church-owned facility.

Senator MIKULSKI. Counsel, rather than getting into a complicated question, let me present you my concerns and then you see if we are both heading in the same direction. I am going to work on the assumption that we both want to do something about the homeless. Second, the construction of new facilities for shelters is both time-consuming and expensive and the need is now.

In many particularly urban, metropolitan areas, inner-city areas—my own city of Baltimore is a perfect example—there are church properties that had been converted into shelters. They had been in some instances old convents, old rectories, those facilities that had been used at one time for housing but need, in order to meet safety codes, need fire alarms. Sometimes it is other things they need, new showers.

In my own city of Baltimore, most of the shelter response has come from either, say, the YWCA that was converted or some other Catholic facilities.

It would seem to me we could get such an enormous bang for the buck, particularly when the properties are available. You have the cooperation of the nonprivate sector. It is in keeping with President Reagan's philosophy of involving the private, nonprofit sector.

Could you then tell me about these regulations and what their impact will be? And if you are so worried about church and state, why do you give them the money to operate the program when you will not give them the money to put in a toilet or a shower?

Mr. DORSEY. The case law has been very strong and our program operations have been very strong in separating money for operations where the money is going directly to benefit poor people who are the recipients of the program—that would be the program operating funds—compared to the construction or rehabilitation of properties.

For example, in the 202 Program we have been very strict in requiring church-related organizations to form a separate not-for-profit corporation before we would allow that organization to be funded to develop a 202 property. And we have found in reviewing case law that there is a very clear distinction between funds going for operating subsidies for programs and funds going for buildings.

We share your concern and are trying to find a way to fund these programs. We recognize that in a number of cases, the homeless shelter programs have been developed by churches themselves, by organizations such as the Salvation Army and other organizations such as this.

Senator MIKULSKI. And we want them to be able to do that, particularly when I am looking at this property that is immediately available. I would like to see these regulations rescinded, keeping, of course, within the framework of the Constitution. I believe in the first amendment. But I also know that we have a crisis out there and we need to respond to it quickly, and these are properties that are available.

Are you saying that they could convert themselves into a nonprofit corporation so that Christopher's Place, which is a facility, say, owned by Catholic Charities, would be a separate standing group? Is that the way you would do it?

Mr. DORSEY. If you had a separate facility; yes. You could lease the separate facility to a not-for-profit organization or transfer title to the separate not-for-profit organization, and you would have the grant go to that separate organization. There would not be a problem.

It is only when the property is owned by the church itself or a religious organization, not strictly a church organization but an organization such as the Salvation Army, which is pervasively sectarian.

Senator MIKULSKI. Let's say this. Suppose the Jesuits had a rectory in downtown Baltimore and they would like to make that available for a shelter. They would then have to establish a nonprofit corporation, say Frank's Place or Ignatius' Place. Ignatius' Place would then become a 501(c)(3). I am sure St. Francis would love this. And then you would be able to put in the necessary bathroom facilities, firerooms, and fire escapes.

Mr. DORSEY. That is correct, or they could transfer title to an existing 501(c)(3) corporation and do the same thing.

Senator MIKULSKI. I would hope you examine these regulations in the most careful way to provide maximum flexibility and less paperwork burden on these areas.

I know that a sophisticated community like Baltimore and a diocese, particularly an urban diocese, could do it. In some of the rural areas, it becomes harder.

Mr. DORSEY. We understand the problem, Senator. It is not a matter of withdrawing the regulations. They are in composed form and we are considering the issuance of final regulations. This precise issue is something that we are studying very carefully.

PROFILES OF THE HOMELESS

Senator MIKULSKI. Mr. Pierce, getting back to the homeless, could you tell me if you have a profile of who they are and some of your strategies to address them? I know that the media attention is often on the grate people, or the people who sleep out at night under the most adverse conditions. In Maryland and other places, the Coalition for the Homeless tells me there are a variety of other people.

Secretary PIERCE. Yes; that is very true. We did a study, and when I say we, it is the Office of Policy Development and Research, and that study was on the nature of the homeless, an estimate of how many there were and so forth.

The thing about the homeless is when a lot of people think about the homeless, they think that somebody just does not have a house to live in. It is much more than that. The vast majority of homeless need much more than a home; they need care, because they have problems of a mental nature. A lot of them have problems with alcohol abuse and drug abuse. It is estimated somewhere between 50 and 70 percent of them have some kind of mental problem.

The problem is also difficult because it cannot be handled solely by the national level of government. It has to be worked on by all levels of government—national, state, and local—together with the private sector.

We are doing some work like that; for example, with the Robert Wood Johnson Foundation. HUD and HHS are working with that foundation to try to give treatment and help to the homeless. HUD has supplied housing; HHS has granted money; and the Robert Wood Johnson Foundation has contributed medical assistance to the homeless.

We also have a task force in the administration which reaches out to federal, state, and local governments, as well as to the private sector, to try to get them to work together to resolve the problem of the homeless.

Now, we are not the only ones who have done a study on this, although I think ours was the first one done in depth. There have been others done after that. Harvard University has done a study and other universities have done studies.

Senator MIKULSKI. Mr. Secretary, in addition to those studies, has your work indicated that a substantial number of people are homeless because of single-parent status and the lack of availability of reasonable housing at reasonable prices? That certainly is one of the problems we are facing in suburban Maryland in Anne Arundel County where we are using the shelter we are trying to develop through Fort Meade.

Those homeless are not mentally ill. Those homeless do not have problems with substance abuse. Their problem is that they are trying to afford housing and are a part of the working poor in our society.

Secretary PIERCE. There are some, of course, but it is not nationwide.

Senator MIKULSKI. How many have you found? Has this shown up in your survey?

Secretary PIERCE. We have not actually counted them; no.

Senator MIKULSKI. You said you have done surveys. You should have these studies. It is your wording.

Secretary PIERCE. Let me have Dr. Koch answer that.

Senator MIKULSKI. No; I want you, Mr. Pierce. You are the Secretary of HUD.

Secretary PIERCE. But I do not make all of these studies. I just read them.

Senator MIKULSKI. But you read them. Then you should know them. This is a national crisis. You should know who is homeless. You should be the chief policymaker for doing something about this.

Secretary PIERCE. Let me tell you this. They say the homeless run somewhere between 250,000 and an outside figure of 500,000, nationwide. They say somewhere between 50 to 70 percent of those people have some kind of ailment. If we take that number, multiply it out and get the balance, you find how small the number is when you get down to the number of people possible to need a home.

WELFARE HOTELS

Senator MIKULSKI. Let's talk about people in the welfare hotels then. Since you do not know how to count them and you have not counted them, then let's go to people that are readily visible and readily recognizable. Let's take the people in welfare hotels in New York. It costs the government $30,000 a year to keep a family in a welfare hotel. What are you doing about providing housing for them?

Secretary PIERCE. The vast majority of those people need more than just a home.

Senator MIKULSKI. Could we start with them; $30,000?

Secretary PIERCE. Sure, and pick out which need more than just a home and see how many of those you have.

Senator MIKULSKI. Let me ask you this. What is HUD and its regional office in New York City doing to get people out of welfare hotels? It is costing us $30,000 a year now. Maybe we ought to give them a $30,000-a-year voucher.

Secretary PIERCE. The city, or the ones who put them in the hotels, we are trying to work with them, as I understand, the best we can.

Senator MIKULSKI. What does that mean, Mr. Pierce? You are the Secretary of HUD for the United States of America. You tell me concretely the three steps that your agency is taking to resolve that. Senator Nickles criticizes Nehemiah. That is one solution that Governor Cuomo has developed with the private sector in working to help solve homelessness.

Secretary PIERCE. What I am saying is we need not just work with New York, not just work with Baltimore. We have taken the step where we have a task force that is now trying to work on the problem and work nationwide. The task force is headed by HHS. We are bringing into that representatives of state and local governments. We have also brought into it people from the private sector.

It is a massive problem; it is not simple. We are working on it.

Senator MIKULSKI. Start with one welfare hotel and empty it out, and I think the nation would applaud you. We are a federation of 50 states. That is what the United States of America is. Yes; it is a national problem, but you attack it by working on local solutions.

You are the very person who sat here and said we have to involve people at all levels. I absolutely believe that. But I want something to be done about this issue and not just going to meetings and not just doing studies. I want something specific, immediate, and realizable. I do not think that is too much to ask of you.

Secretary PIERCE. We all do, and we are working on it.

Senator MIKULSKI. I know my time is up, Mr. Chairman, but I felt that these were issues that had to be raised.

Senator PROXMIRE. Thank you, Senator Mikulski. We will have the Secretary before us again tomorrow. We can pursue that and some of the other issues further at that time.

PUBLIC HOUSING AUTHORITY VIEWS ON THE VOUCHER PROGRAM

Mr. Secretary, in your prepared statement, you indicate that many public housing agencies are telling you how good the voucher program is. The only studies I am aware of, one by the New York City Housing Authority and one by the Oakland Housing Authority, are critical of vouchers. They say they are not good and they criticize them.

Can you tell the subcommittee which public housing agencies have conducted studies that yield opposite results?

Secretary PIERCE. I cannot say that they have conducted studies, but we have received some affirmative information from Maryland and several other states that have given us information about this. I cannot remember all of them off the top of my head. I do not say they are studies, but what they have said about vouchers has been highly favorable.

Now, the person at HUD who has been working on trying to get vouchers moved as fast as possible has been the Assistant Secretary of Housing. Maybe he has the names of some of these states.

Senator PROXMIRE. Before he does that, I specifically asked for studies, because I wanted to know which cities. Public housing authorities in New York, as I pointed out, and Oakland that have made studies have been critical of the voucher system. I wanted to know what studies there are that would support your position that the voucher system is working and that it is constructive and is the way to go.

If you do not have those studies and you have opinions, that would be useful too and I would like to know that.

Secretary PIERCE. I know we do have opinions; I do not know whether we have studies. I will ask.

Mr. DEMERY. Senator Proxmire, I am not aware of any studies beyond the initial study in New York City that has been done that was initially critical of the Voucher Program.

What I do know is that I have right now requests from PHA's all around the country for additional vouchers because they have used up their allotted fair share amount. That includes Oakland, Puerto Rico, Boston, North, South, East, and West.

What we have and what I believe the Secretary was basing his answer on was a groundswell of demand for additional vouchers because the PHA's have exhausted their supply.

PRELIMINARY RESULTS OF VOUCHER STUDY

Dr. KOCH. Mr. Chairman, as we discussed earlier in regard to studies, what we have so far is the first stage of the voucher report which is being finalized and gives us an indication of what is occurring in the 20 locations where we actually are studying the matter.

I might, in regard to that, address a question you asked earlier when you recounted an anecdote reported by Chairman Gonzalez. You raised the question of those who are renting in place whom the landlords may gouge, or they may gouge the federal government.

We do have national figures that have come in from the study, and those renting in place in the Certificates Program are paying on average $29 higher rent than they were paying before joining the program; in the voucher program they are paying, on average, $44 higher than before they joined the program.

Senator PROXMIRE. In the Oakland experience to date with vouchers, they have it broken down into studio, one-bedroom, two-bedroom, three-bedroom, four-bedroom, and so forth. And they find that the vouchers are above section 8 in every single category, ranging from 14 percent to 22 percent.

The housing assistance payments by bedroom size, the difference goes up to 30 percent. So the Oakland study seems to corroborate the criticism by the New York study, indicating that the vouchers are substantially higher than section 8, and they have no instance where they are lower.

Dr. KOCH. We would like to review that study. We do not have that.

Senator PROXMIRE. Fine.

Mr. DEMERY. Senator, I am unaware of the document from which you are reading.

Senator PROXMIRE. Can you tell us what percentage of families pay more than 30 percent of their income for rent under the voucher program?

Dr. KOCH. The national average?

Senator PROXMIRE. The average, the Secretary testified, was about 31 percent in New York City. My concern was what percentage of families pay more than 30 percent, because of course, the average can mean, as pointed out, some pay 9, some pay 60. I wanted to get some notion of how much the excess over 30 percent is, if you can provide that.

If you do not have that today, perhaps you can have it tomorrow.

Dr. KOCH. We will try. The data we would have would be simply from the voucher study which may not be broken out that way. But we will try to be prepared with that. But that is a limited universe of vouchers.

In regard to the vouchers that are under the free-standing and the Rental Rehab Program, we would not have that data available yet.

PUBLIC HOUSING MODERNIZATION

Senator PROXMIRE. As you indicated in your opening statement, Mr. Secretary, you are requesting $563 million for public housing modernization next year, which with a carryover of $467 million in the current year would permit you to conduct a $1 billion program.

On December 15 of last year, The Wall Street Journal carried an article indicating that many public housing projects, and I quote now, "are in an advanced state of decay, and the deterioration is getting worse," unquote.

MODERNIZATION NEEDS STUDY

Now, I have been critical in the past of the huge amount of money the federal government has spent on the construction of new subsidized housing units, especially section 8 units. But I think we have to do our best to see that public housing units currently occupied do not fall out of the system. That is why I wrote you recently regarding a modernization needs study the Congress commissioned back in 1983.

HUD awarded a contract for this study to Abt Associates in late 1983, and the study was to have been completed by December 31 of last year. What has Abt delivered to HUD thus far under that contract?

Secretary PIERCE. I received the first report from Abt yesterday, and I sent up a copy to you. You did not receive it yet? I just got it yesterday.

Senator PROXMIRE. I presume if you sent it yesterday, we should have it today sometime. We do not have it as yet.

Secretary PIERCE. I thought I had it with me.

My people have gone over this. By my people, I mean the people in the Office of Policy Development and Research. And they are in disagreement with parts of that report. What we would like to do is, after we have had a chance to study this report, we would like to make a report to your committee on it. In order to do this, we have to go through certain steps.

We have to go before an advisory group, because that is the way this thing goes. The Abt report goes before an advisory group. We will go before the advisory group and present our arguments on the contents of the report. After we have made our presentation and the Advisory Committee has reacted to it, we will make a report to you.

It takes a little time, because when we make our report to you it has to go through OMB. But that is the way, if possible, we would like to handle this.

ESTIMATED COSTS IN MODERNIZATION STUDY

Senator PROXMIRE. Let me ask you a few questions about the Abt report. First, what estimates has Abt supplied HUD on the costs of modernizing the national public housing stock, the overall costs?

Secretary PIERCE. That figure is around $21 billion. But that is an immediate point of disagreement, because that figure, our people say, takes into account a number of things that should not be there at all, that it is not pure modernization. If you get down to pure modernization, it should be around $10.7 billion.

Senator PROXMIRE. What are the elements on which you disagree with Abt as far as modernization is concerned? Can we get some judgment as to that?

Secretary PIERCE. They have included in their study the redesign of public housing projects, as well as certain additions, which we do not believe should be included in modernization.

Senator PROXMIRE. How much would that be?

Secretary PIERCE. The redesign costs would be about $2 billion.

Then there are additions and upgrades beyond the CIAP mandatory standards. They were added to the study at the request of the research advisory group. They break down into two parts amounting to $3.7 billion and $4.7 billion. That is a total of $8.4 billion.

Senator PROXMIRE. What kind of addition would that signify?

Secretary PIERCE. I am looking at the breakdown with our people here. Let me ask Dr. Koch to speak to that.

Dr. KOCH. The way the study was set up on additions and upgrades [ADD's] was that the PHA's in the survey suggested what they would like to have added, and the inspectors gave a second opinion when they went to the actual projects. Some of the ADD's are to bring the projects up to code standards, and that is not in the category the Secretary is describing.

Senator PROXMIRE. So to bring the project up to code standards is not in the basic request by HUD but it was included by Abt; is that right?

Dr. KOCH. No; ADD's were included in what we asked the study to look at. But not all ADD's are included in the numbers that the Secretary cited earlier. We are saying there is $10.7 billion.

Senator PROXMIRE. Would $10.7 billion bring it up to code standard?

Dr. KOCH. It would take care of all the itemized, backlogged needs to bring projects up to code standards, and it includes other things as well, the energy component and the lead-based paint component—we also have that report—and handicapped access.

Senator PROXMIRE. Before you go on, let me say that there is an enormous difference here, a difference of about 100 percent. One is 10 and a fraction and the other is 21. So I would like to know, and maybe tomorrow you can tell us, what those differences are. Abt is a competent group. Apparently they have reasons for going that high. So if you can tell us tomorrow what the differences are, that would be helpful.

Dr. KOCH. We would be happy to.

Senator PROXMIRE. When will Abt deliver its final report to HUD? I take it this is not the final report.

Secretary PIERCE. No; it is not.

Dr. KOCH. This is the first part of the national estimates report which, again, has to be revised because we found a gross error in the calculations. What you, therefore, have is a draft, where the estimates have been corrected but still are not totally and completely accurate.

We will have the field estimates, based on these national estimates, within about 2 weeks.

The other major part of the whole study, which was to come in, is what we are calling accrual needs, which are long-term repair needs for major systems. And Abt has informed us that they are not at this point prepared to give us that and have run out of money.

The final thing we required was documentation of all the data, so that we would finally have a complete database. And they say they are not prepared to deliver on that now, either. We are in discussions with them to see what we can, indeed, get.

Senator PROXMIRE. When and how will HUD make the results and documentation from the study available to the Congress, to the public housing community, and to the public?

Dr. KOCH. Of this first part of the study or the total study?

Senator PROXMIRE. The total study.

Dr. KOCH. Right now I cannot tell you, because we are trying to find out what our options are.

AVAILABILITY OF NEEDS STUDY

Senator PROXMIRE. All right, then when will the first part of the study be made available?

Dr. KOCH. We have made the first part of the study available to the research advisory group. That went out. As we received it, letters were sent out to the research advisory group [RAG]. And we hope to meet with the RAG. I think we have invited them to a meeting within 3 weeks. We will then have their input, and we can write our full report that will accompany the draft we have. It will go through clearance in the Department, OMB, and be sent to Congress.

We will be done with it, I think, within a month, 2 months at the outside, and will go to OMB and, we hope, quickly to the Hill.

Senator PROXMIRE. So by May 1 or June 1, you will be able to make a release on the first part of the study; is that right?

Dr. KOCH. If OMB clears it quickly.

Senator PROXMIRE. Why has the housing modernization contractor missed so many deadlines, Mr. Secretary? They were supposed to make this report in December, and it is not going to be made available until 6 months later.

Secretary PIERCE. I really cannot tell you that, sir, because until just recently I did not get involved in this. My Assistant Secretary has been dealing with this, and she can tell you where the differences are.

Senator PROXMIRE. Can you tell me whether Abt is behind schedule on any other HUD-commissioned studies?

Dr. KOCH. They are doing the major voucher study for us, and they are on schedule in the voucher study.

FAIR MARKET RENT DETERMINATIONS

Senator PROXMIRE. In August 1986, the General Accounting Office came out with a report that was critical of the way HUD determined far market rents. The report indicated that under the appeals process, the fund determination is made by headquarters for new unit rents and by the applicable field office for existing unit rental adjustments.

The HUD report indicated that this resulted in one-bedroom rents in Suffolk County, N.Y., being set at a maximum of $470 per month for new units and as much as $633 per month for apartments that were already in the program.

My question is: To what extent do such disparities exist in other parts of the country? Is this unusual or is this common?

Secretary PIERCE. This is rather unusual, and details of that Tom Demery can give you.

Senator PROXMIRE. Mr. Demery?

Mr. DEMERY. Because it is unusual, the answer is a little bit complicated, Senator. This is not a pervasive, widespread national situation. There are a lot of very unique circumstances that went into the Suffolk County situation, and I would be happy to supply them for the record. If you would like me to go through it with you now, I can summarize the two key points that make up the difference.

Senator PROXMIRE. Go ahead.

Mr. DEMERY. In 1983, the basis for determining the fair market rents were changed. It had been pegged at the median rent for the area, and after 1983 it was lowered to the 45th percentile of rents for the area. This accounts for one-half of the difference.

In 1984 and 1985, our New York office approved revised annual adjustment factors in response to community comments, which were solicited, and that accounts for the other half of the difference.

It is just that there are approximately 78 or 80 annual adjustment factors for the entire country. They include broad areas. In the case of Suffolk County, it included New York, which had a tendency to drive down the overall average. And as a part of the process, because we recognize they take in such large SMSA's, local areas can, in fact, come and make a specialized appeal for differences unique to their particular situations.

That is what they did here, and they were able to prove their case and stand on their own.

Senator PROXMIRE. Thank you, sir. There is a rollcall now on the veto override on the highway program. So I am going to have to recess the committee temporarily. I will be back in about 10 minutes. The committee will stand in recess for 10 minutes.

[A brief recess was taken.]

VOUCHER STUDY IN OAKLAND, CALIF.

Secretary PIERCE. Mr. Chairman, Tom Demery has something he would like to add. Could he speak, please?

Senator PROXMIRE. Yes, indeed. The committee will come to order.

Mr. Demery, go right ahead, sir.

Mr. DEMERY. Mr. Chairman, I assume the Oakland study you were referring to on vouchers was Oakland, Calif.?

Senator PROXMIRE. Yes, sir.

Mr. DEMERY. I would appreciate receiving a copy of it, because I have checked with my office and we really knew nothing about it. It was a little disconcerting to me as I was hearing your statements. Just for your information, the Oakland PHA has more units under lease under the Voucher Program than any PHA in the country. In fact, they have requested an additional 500 vouchers from us to put to immediate use and put them under lease. We have had several meetings out there with the people in Oakland, and before today I would have counted them as one of the program allies.

Senator PROXMIRE. You see, the trouble, Mr. Demery, is the demand for it, which you seem to feel is the measure of its utility, indicates that they like it. But it also may be the most expensive, the most inefficient as far as the taxpayer is concerned. That is why I tried to show those discrepancies.

Mr. DEMERY. You had requested some information.

Senator PROXMIRE. I understand. We will make that available to you so that you will have the Oakland study.

SECTION 8 EXISTING HOUSING AMENDMENTS

Mr. Secretary, regarding existing housing amendments, you are requesting $362 million next year for amendments to existing section 8 units. That is a substantial reduction of about $42.7 million below the 1987 estimates. Can you tell me why you anticipate a reduction of that magnitude when the reduction between 1986 and 1987 was only about $14 million? This is three times as great.

Secretary PIERCE. The basic reason, Mr. Chairman, is that we are trying the best we can to reduce our budget to try to do a job with respect to the budget deficit problem. And taking everything into account, that was one of the things we did in an effort to improve our budget deficit situation.

Senator PROXMIRE. That is an estimate that is unlikely to be realized, it seems to me. Does your funding formula for existing section 8 units include potential rent increases, for example? And, if so, how do you calculate that figure?

Mr. KLIMAN. Mr. Chairman, with regard to existing housing amendments, there are a number of factors involved. We had a bit more in existing housing amendments in 1986 and 1987 than we are projecting for 1988.

Senator PROXMIRE. A bit more? You had $42.7 million compared to $14 million, three times as much.

Mr. KLIMAN. Because of amendments to the definition of income in the 1983 legislation, we had to provide funds for rent rebates. And we included funds for that in 1986 and 1987. That ought not to be a requirement in 1988. We had a large requirement then.

The balance of amendment needs are based upon surveys of the field. It is not necessarily a figure that either must go up or must go down. It is based upon calculations from surveys of the field, surveys of projects determining how much project reserve they have out there, whether or not they need more in order to meet the balance of their contracts. It is not a complicated thing. We can supply some detail on that for the record, if you wish.

[The information follows:]

AMENDMENT NEEDS FOR RENT REBATES

A number of factors affect how many public housing authorities will run out of money and require contract amendments. A major factor has been rent rebates. As a result of revised income definitions in the Housing and Urban-Rural Recovery Act of 1983 (Public Law 98-181), retroactive rebates are made to tenants upon recertification of income. Rebates are paid retroactive to October 1, 1984. Rent rebate cost estimates for 1986 were $296.4 million for the section 8, section 236, and Rent Supplement/Rental Assistance Programs. An additional cost of $147 million was estimated as a result of reduced rent collections reflecting revised income definitions. An estimated 2.6 million households are expected to be eligible for rebates under these programs. We assume that rent rebates will be completed by the end of fiscal year 1987.

For the section 8 program, rent rebates are provided from project reserves. Subsequent to the payment of rent rebates, some projects or public housing authorities may immediately require amendments to replenish project reserves to appropriate levels. Amendments may not be immediately required but may be necessary at some later time as a result of tenant rebate payments. In either case, the payment of retroactive rebates will result in reduced project reserve levels and an increased need for amendments.

Senator PROXMIRE. Can you tell us also how many public housing authorities eventually run out of money and have to have their contracts amended before their 15-year term expires?

Mr. KLIMAN. I am not sure if we have the number of authorities. I was asking that question yesterday. But we can certainly provide you with a rather substantial amount of detail. Whether it is that particular one or not I am not sure yet.

[The information follows:]

FUTURE AMENDMENT NEEDS

We are currently in the process of analyzing project reserves and estimating future amendment needs. When this process is complete, we may be able to determine how many PHA's will run out of money, requiring that their contracts be amended before the expiration of their 15-year term.

Senator PROXMIRE. Do you have control procedures in place to identify program amendment needs before programs actually run out of funds?

Mr. DEMERY. Yes.

Mr. KLIMAN. Tom Demery actually runs that program.

Mr. DEMERY. Yes, we do, as Mr. Kliman stated. There is an amendment survey that is done annually which takes into account the remaining balance within the ACC account and factors in any changes in expenses, any adjustments for inflation, any adjustments in administrative fees over the remaining term of the ACC contract. And then a factor is applied on a subtraction basis as to how much tenant contributions we can expect over that same time period as an offset to come up with a number. That is our procedure and our control.

Then as was stated, it is not an automatic adjustment, but it is review that does take place annually, to make sure that there is not a surprise.

HODAG

Senator PROXMIRE. Let me ask you, Mr. Secretary, about the HoDAG Program. In Wisconsin, the HoDAG is a mythical creature with a horn. Rhinelander, Wis., is known as the home of the horned HoDAG. [Laughter.]

I am not asking about the horned HoDAG; I am asking about, of course, the rental program. I understand the administration would like to terminate the Rental Housing Development Grant Program, referred to as the HoDAG. The Congress provided $99.6 million for the program in fiscal year 1987.

Your inspector general [IG] has been somewhat critical of the way in which HoDAG funds are being disbursed. He found that you have not provided for adequate safeguards to prevent windfall gains from accruing to owners and that HUD is unable to ensure that the units subsidized under the program remain affordable to families in need of housing.

Your IG recommended that HUD issue written procedural/policy instructions to ensure that affordable rental housing is provided, program objectives are achieved, and grants do not exceed program limitations.

What steps are you taking to carry out the IG's recommendations?

Secretary PIERCE. To carry out those recommendations? As you know, we are not asking for any more money for HoDAG, but Tom Demery has taken certain actions to try to improve the situation.

Mr. DEMERY. Let me address some of those questions directly. With respect to assuring that the property remains for low-income use, we have required that each project have covenants running with the land which are recorded ahead of the first mortgage and acknowledged and agreed to by the lender, the owner, and the grantee. In addition, we require that 20-year financing, such as balloon payments or any other mandatory refinancing, cannot interrupt the economic feasibilily which was established at the time of funding.

With respect to certifications, project closeouts and cost certification procedures are in the process of being put in place and will be in effect not later than October 1.

Senator PROXMIRE. Have you actually issued written procedural program objectives, instructions, before rental housing is provided?

Mr. DEMERY. In the way of deed restrictions, yes.

Senator PROXMIRE. You have done that.

DEBT COLLECTION

You are requesting, Mr. Secretary, $169 million for the Federal Housing Administration Fund next year, with $118 million to be applied to debt reduction. In discussing that budget, I would like to focus on your debt collection efforts because they have a significant impact on the cost of the program.

Last May, the General Accounting Office reported on federal debt collection activities generally and took a fairly close look at your multifamily, single-family, and title I programs. These programs accounted for $1.4 billion in delinquent debt, 88 percent of your total delinquent debt of $1.6 billion as of September 30, 1985.

Can you tell us what your delinquent debt was as of September 30, 1986, a year later?

Secretary PIERCE. Have we got that figure?

Mr. KLIMAN. The official figure for delinquent debt as of September 30, 1986, was $928,210,000. That is somewhat overstated since it includes items in foreclosure. A more refined figure would be $839,120,000.

Senator PROXMIRE. So it has been reduced very sharply. How much did you write off?

Mr. KLIMAN. I do not have the figures on writeoffs with me, but it certainly was not $1 billion.

Senator PROXMIRE. The difference is about $700 million.

Mr. KLIMAN. I am not familiar with those earlier figures you recited, but I do know that the Department of Housing and Urban Development has been a leader in the government in debt collection efforts. The Department was out in front before the rest of the administration came in.

Senator PROXMIRE. I may want to follow up on that, but before I do will you give me the delinquent debt figure as of September 30 tomorrow? Can you get that for me by then for the writeoffs?

Mr. KLIMAN. Yes, sir.

Senator PROXMIRE. I meant the writeoffs. You have given me the delinquent debt. You will do it if you can.

Let me ask you this. GAO believed you should be more aggressive—and you say that you have done a good job in debt collection. GAO, however, said you should be more aggressive in referring delinquent debtor accounts to credit bureaus. Are you doing that routinely now under your single-family program?

Secretary PIERCE. This is Judith Hofmann, our Assistant Secretary for Administration; she runs this program.

Senator PROXMIRE. Go right ahead, ma'am.

Mrs. HOFMANN. Mr. Chairman, we have taken internal measures to improve our debt collection. It has been our No. 1 priority. We have done this instead of contracting out for collection of our delinquent debt. We wanted to see what we could improve ourselves first, and we have made some tremendous improvements.

Since 1982, the Department has brought in almost $1 billion more than it would have without——

Senator PROXMIRE. Let me specify. My question was: Are you referring delinquent debtor accounts to credit bureaus under your single-family program.

Mrs. HOFMANN. Yes, sir; we are.

USE OF PRIVATE COLLECTION AGENCIES

Senator PROXMIRE. My second question is this. GAO also believed you could benefit from gaining experience in the use of private collection agencies to supplement ongoing collection efforts. Are you using private collection agencies?

Mrs. HOFMANN. No, sir.

Senator PROXMIRE. Why not?

Secretary PIERCE. It is because I thought we could handle it and do a good job ourselves. And I believe we have. I was very happy to learn that we have the second lowest delinquency of any department or agency in the government. So I think our people are doing very well. We train our people in this, and they do a job and we get results.

Senator PROXMIRE. Have you tried the private collection agencies to any extent at all to see what your experience would be with them?

Secretary PIERCE. In certain areas we have, and we find that we do not think they are——

Senator PROXMIRE. Could I have the results of that for the record?

Secretary PIERCE. Yes, sir.

[The information follows:]

PRIVATE COLLECTION AGENCIES

HUD began using a private collection agency to collect debts owed the federal government in January 1987. Since that time, the Department has referred 1,202 cases representing approximately $8 million in debts to the contractor for collection. To date, $25,534 has been collected.

The referrals to date are part of a pilot project designed to test the feasibility of using private collection agencies either together with or in lieu of in-house collection efforts. To this end, both costs and benefits of contractor collections, including the approximately 10 percent fee paid for all collections, will be assessed as the pilot project continues, and will be compared with costs and benefits of performing this function in-house.

The Department has already accomplished a great deal through its efforts to collect debts owed to the federal government. Initial efforts, begun in 1981, concentrated on organizing and training our in-house staff first to recognize the importance of this function and then to develop their skills in this area of responsibility. The results of these efforts have been recognized by both the Office of Management and Budget and the Department of the Treasury.

OFFSETS AGAINST GOVERNMENT SALARIES

Senator PROXMIRE. Finally, GAO felt that the Department should explore the use of deductions from the salaries of delinquent federal employees in the single-family assignment program and weigh the costs and benefits of that effort. As GAO said, the use of salary deductions prior to foreclosure might eliminate the need for further action.

Are you exploring that approach to delinquent debt?

Mrs. HOFMANN. Yes, sir; we are. And we already do that for delinquent title I debt.

Senator PROXMIRE. How are you exploring it? What are you doing?

Mrs. HOFMANN. For delinquent title I, we have computer matches with the records at the Office of Personnel Management, with the Defense Department, and with the Postal Service. We match their records against our delinquent debtor list. When we have a match, we refer it to the employing agency to contact the individual. The agency is also asked to offset the debt against the employee's salary and to send those moneys to HUD.

FHA DIRECT ENDORSEMENT PROGRAM

Senator PROXMIRE. Secretary Pierce, I am concerned about the possibility that the Direct Endorsement Program could be producing inaccurate appraisals of insured properties and exposing the Federal Housing Administration to unwarranted risks. As you know, under the program, mortgagors assume responsibility for mortgage loans and obtaining insurance endorsements without prior FHA review and approval.

In November 1985, your inspector general issued a report that pointed to a growing backlog of 6,400 direct endorsement cases at the Washington field office, making it impossible for the office to monitor underwriting quality in a timely manner. A March 1986 report indicated your St. Louis office was allowing appraisers to depart from prescribed appraisal requirements without explanation.

My question is: What have you done to correct these problems and to assure yourself that they are not national in scope?

Secretary PIERCE. We have discussed them.

Tom, why don't you answer the question, since you have done the detailed work on this.

Mr. DEMERY. The backlog problem was created, of course, by the substantial reduction in interest rates that we experienced and it caught, quite frankly, all of us a little bit by surprise. We have attempted to resolve this problem and meet the challenge head on through additional staff. We have taken in about 150 appraisers and trained them.

In the meantime, we have tightened up our field monitoring staff. We have now 33 people in the Office of Field Monitoring that will enable us to audit and visit up to 1,700 direct endorsement cases in the field to make sure that we are not being taken advantage of, to make sure that the program is operating properly. We are targeting these in the offices of previously highest backlog and high concentration of direct endorsement activity.

Senator PROXMIRE. It seems to me the Direct Endorsement Program is particularly vulnerable to fraud and abuse. What controls have you developed to assure that this is not happening?

Mr. DEMERY. We are denying insurance to borrowers who have had previous FHA loans in default or which have resulted in insurance claims during the last 3 years. As was stated earlier, we report FHA foreclosures to national credit bureaus. We require credit reviews on buyers that assume FHA loans within 2 years of endorsement of a prior assumption. We have shortened the term of FHA conditional commitments from 12 to 9 months. We are pursuing sanctions against those who abuse our programs. We have strengthened the Mortgage Review Board which handles the sanctions against FHA-approved lenders. And we have taken a very high profile with respect to publicizing actions that we have taken against those lenders who have abused our programs. So it is a combination of all those things.

PUBLIC HOUSING OPERATING SUBSIDIES

Senator PROXMIRE. You are requesting $1,376,862,000 in the coming fiscal year for public housing operating subsidies, an increase of $26 million over your current appropriation.

You are also asking that we give you the authority to obligate $85 million from last year's appropriation in fiscal year 1988. However, the conference report on last year's bill directs that any 1987 funding in excess of performance funding system requirements shall—and I stress "shall"—be made available for increased liability insurance expenditures.

Why is that not being done?

Secretary PIERCE. This is James Baugh, our General Deputy Assistant Secretary for Public and Indian Housing.

Mr. BAUGH. Mr. Chairman, you are correct that the appropriation language was quite clear and precise and that any money remaining after the 1987 performance funding system requirements are met should then be used primarily for insurance.

When we calculated that amount of money, it was approximately $50 million. We now are in the process of studying how best that money can be utilized. We are working very closely with the Council of Large Public Housing Authorities [CLPHA], also with the National Association of Housing and Redevelopment Officials [NARHO] and other interest groups.

We plan to use this budgeted amount of money to fund a portion of the Public Housing Agency and Indian Housing Authority insurance costs. With these funds, the PHA's and IHA's then will be able to decide whether to go back with nonprofit, self-funded pools, PHA- or IHA-sponsored insurance companies, or pay premiums to private insurance companies. We have to report to the Congress by June 30 of this year. So we are in the process of making analyses and coming up with the best kind of methodology to distribute these funds to the PHA's or IHA's.

INSURANCE COSTS IN PUBLIC HOUSING

Senator PROXMIRE. Last year's Senate report directs the Department to better assess the extent and nature of the rapidly escalating insurance costs of housing authorities and to explore a long-term solution to that serious problem. Can you give us a report on the progress you are making in that area?

Secretary PIERCE. Yes; we have worked on that, and Mr. Baugh can report on that, sir.

Senator PROXMIRE. Go ahead, sir.

Mr. BAUGH. In some states, Illinois, for example, self-funded pools have been created by PHA's. We will continue to approve the formation of such pools. In addition to that, we have provided technical assistance to public housing agencies in other states to come up with ways to ensure that those housing agencies that find it impossible to pay insurance premiums because of spiraling costs can be covered for losses.

We have granted waivers to a number of PHA's that cannot at this time get insurance at an affordable price. We have waived section 305 (A) and (B) of the annual contributions contract [ACC]. This permits those agencies to set aside the money they would have paid in premiums to pay for their own uninsurance losses.

Senator PROXMIRE. Thank you, sir.

SUBMITTED QUESTIONS

[The following questions were not asked at the hearing but were submitted to the Department for response for the record:]

QUESTIONS SUBMITTED BY SENATOR PROXMIRE

OPTIONS AVAILABLE TO CORRECT PHA PROBLEMS

Question: Secretary Pierce, we both know that some public housing authorities are managed very well and other not so well. I'm told that some HUD staff have expressed frustration at their inability to induce a few public housing authorities to comply with laws, regulations, and program guidance. Apparently, the only real leverage they have is the ultimate weapon of declaring a breach of the annual contributions contract and taking over the agency.

Can you tell us what remedies are available to you to correct problems at poorly managed public housing agencies short of a breach of contract action?

Answer: The Department has a number of options that can be used as leverage with poorly-managed Public Housing Agencies (PHAs). The option chosen depends on the severity and longevity of the management problems, as well as the willingness and ability of the locality to make the necessary improvements. Short of a breach of contract action that leads to a virtual HUD takeover, the following options are available:

-- Designation of a PHA as "troubled" sometimes can stimulate a PHA to institute the necessary changes. The "troubled" designation also can serve to get the attention of local elected officials who in turn can install new leadership at the PHA.

-- HUD can withhold or condition PHA receipt of Comprehensive Improvement Assistance Program (CIAP) funding pending evidence that the PHA is making or will make the requisite management improvements.

-- HUD is in the process of "decontrolling" PHAs which can meet a definitive set of performance standards. Consequently, PHAs with serious management problems are not likely to be among the "recognized performers" and will not be eligible to benefit from reduced reviews, reporting and approval requirements that will be permitted for "recognized performers."

-- HUD can negotiate with the local elected leadership to put a PHA under private management that is responsible either to HUD or a competent local Board of Commissioners. Preferable to breach, this option carries a specific time after which the locality is expected to resume full control of the PHA.

-- In cases of serious mismanagement of PHAs, HUD can impose administrative sanctions on individuals and PHAs in accordance with 24 CFR, Part 24, including debarment, suspension or temporary denial of participation by specific PHA employees. In addition, the Department may withhold development and/or modernization funds if a PHA continues to deal with anyone who has been debarred by HUD.

-- PHAs which do not meet prescribed management performance standards are subject to detailed budget reviews which gives HUD the opportunity to disallow ineligible or inappropriate expense items. Further, in regard to all programmatic steps where HUD approval is required, HUD can keep close oversight and control of PHAs with a poor management record.

NEED FOR ADDITIONAL MANAGEMENT AUTHORITY OVER PHAs

Question: Do you believe you need additional authority, statutory or otherwise, to deal with recalcitrant public housing authorities?

Answer: The existing authority under the statute and the Annual Contributions Contract (ACC) provides an adequate basis for Departmental sanctions to enforce PHA obligations to the Federal Government, except where Public Housing Agencies (PHAs) fail to obtain required audits.

Where HUD finds problems that indicate generally poor management performance by PHAs, the Department tries to use persuasion to negotiate a "workout plan" remedy on a voluntary basis without invoking formal legal sanctions. In taking that approach, HUD strongly emphasizes the element of local authority and responsibility. Just as a well managed PHA is allowed to determine how to meet its program responsibilities, a poorly managed PHA is required to assume primary responsibility for devising and carrying out the particulars of corrective measures that are effective for local conditions. For cases where a stronger enforcement stance is necessary, the options already described can be used.

Where a PHA fails to comply with its contractual obligation to obtain periodic Independent Public Accountant (IPA) audits, the Department's current legislative proposal would provide the statutory authorization to permit HUD to hire an IPA to perform the audit, put the PHA's records into auditable condition and pay the costs out of the PHA's future operating subsidy eligibility.

Question: The performance measurement system was supposed to track whether rehabilitated units continue to serve lower income families for at least seven years. How is HUD assuring that projects funded under the program continue to serve lower income people?

Answer: Currently, the Department through its Cash and Management Information System, knows the rents of all units after rehabilitation is completed. Over 92 percent of completed units currently have rents below the Fair Market Rents (FMRs) for the Section 8 Existing Program. It is our intention to use the percentage of completed units with rents below FMRs as one of the performance measures for the reallocation of funds in fiscal year 1987. The Department will also do a statistically significant sample of completed units in future years for each grantee in order to determine how well the grantees chose neighborhoods and projects which would continue to be affordable over time to lower-income tenants. Performance on this factor will continue to affect grantee funding levels.

RENTAL REHABILITATION GRANTS

Question: Secretary Pierce, in your opening statement you refer to a $75 million request for the rental rehabilitation grant program. Your justifications indicate you are planning to administer the program under the Community Planning and Development activity.

In 1979 the General Accounting Office came out with a report on the use of Community Development Block Grant rehabilitation funds. The report indicated that communities could use these funds more efficiently if they would provide loans rather than grants to homeowners. In response to that report, HUD stated that in principal they agreed that direct grants are costly and ineffective but that in some instances--with small localities, for example--they should be permitted.

It seems to me that the same principle should apply to the Section 8 rental rehabilitation program and in fact, your justifications refer to deferred payment or below market interest rate loans. Can you tell the committee what percentage of rental rehabilitation funds are provided with a loan repayment requirement?

Answer: Based on information in the 1987 Annual Report to Congress, the following table shows the forms of Rental Rehabilitation Grant Assistance:

Forms of Assistance	Percent of Program Funding
Deferred Payment Loans	64 Percent
Direct Loans	11 Percent
Grants	21 Percent
Other Forms	4 Percent
TOTAL	100 Percent

As indicated from the above data, loan repayments would be required for about 75 percent of the assistance provided--64 percent deferred payment loans and 11 percent direct loans. The deferred payment loan form of assistance means that repayment is normally not required to begin until a project is completed and operating, whereas a direct loan normally requires repayment to begin immediately.

Question: What steps is HUD taking to encourage communities to use rental rehabilitation funds as loans to property owners rather than as outright grants?

Answer: HUD is not encouraging communities to use rental rehab funds as either grants or direct loans. Rather, to maximize private investment, the Department has encouraged grantees to utilize deferred payment loans, for which repayment is not required until a project is completed.

SECTION 202

Question: You are requesting virtually no new Section 202 Elderly or Handicapped housing money in fiscal year 1988 but simply plan to carry over about $266 million in existing funds so that you can make 2,000 unit reservations next year.

In looking at page C-13 of your justifications I note that your cost estimate for a Section 202 unit in 1987 is $6,678 as compared with an actual per unit cost in 1986 of $6,872. Why is the per unit cost of this program falling?

Answer: During fiscal year 1986, Section 8 authority for project applications selected under the Section 202 program was reserved at 110 percent of the published Fair Market Rent (FMR) as permitted under the existing program regulations. The purpose of the higher reservation amount is to reduce the need for subsequent amendments to the proposals during firm commitment processing on the proposals. During fiscal year 1986, there was sufficient Section 8 authority to approve projects using this higher level and still support the number of units which Congress had intended as reflected in the Conference Report accompanying the 1986 Appropriations Act and subsequent modifications in the Operating Plan approved by the Appropriations Committees. For fiscal year 1987, the average unit cost of $6,678 per unit will support reservations at approximately 105 percent of the Section 8 FMR. The lower reservation amount is necessary in order to fund the roughly 12,000 units assumed by the Congress in the 1987 Appropriations Act.

CONTROLLING FRAUD

Question: In May of 1985 the General Accounting Office reported that the procedures being followed in granting mortgage insurance should be strengthened to prevent fraudulent behavior. On June 3, 1986, GAO prepared a briefing report for Senator Lautenberg regarding the steps HUD had taken to adopt the earlier GAO recommendations. The report pointed to several areas in which HUD still had not fully adopted those suggestions.

One of GAO's recommendations was that credit reports showing no previous credit history should be questioned by HUD because the borrower, real estate broker, or lender may have provided misleading information to the credit bureaus, such as social security numbers of the borrowers' children rather than the borrowers' social security numbers.

Although HUD responded that appropriate instructions would be issued, as of May of last year there had been no such issuance. Have you addressed the problem in the interim?

Answer: With regard to the GAO recommendation that HUD question credit reports that show no previous credit history, we issued a Directive to our Field Offices on May 19, 1986. The Directive instructed the Field Offices to order a back-up credit report (from a different credit bureau) if the report filed with the application shows no credit history and was issued by a bureau that has provided poor single family mortgage insurance information in the past. This Directive applies only to applications processed by HUD (about 15 percent of business). We are currently drafting similar instructions for Direct Endorsement lenders to implement. (Direct Endorsement applications account for about 85 percent of single family business).

Question: Are there any other corrective actions that still need to be taken or have all of the GAO recommendations been implemented?

Answer: There were five GAO recommendations. Of these, the recommendation dealing with Credit Reports was implemented on May 19, 1986 (see above) while the recommendation concerning VA Property Appraisal became moot as the VA stopped issuing Certificates of Reasonable Value when there is not a VA buyer. The remaining three GAO recommendations applied to Monitoring Early Defaults, Verifying Lender Data and Appraisals of Investor-owned Properties. In each case, HUD initiated new measures to improve its monitoring system and/or program procedures.

PHAs/IHAs RECEIVING MODERNIZATION FUNDS

Question: As I understand it, between 600 and 700 public housing authorities are currently receiving modernization funds. Is this correct?

Answer: As of September 30, 1986, 1,748 Public Housing Agencies (PHAs) and 104 Indian Housing Authorities (IHAs) were receiving Modernization funds for a total of 1,852.

PROPOSED COMPREHENSIVE GRANT PROGRAM

Question: Apparently the Department would like to replace the present needs based public housing modernization budget with a block grant program that would distribute modernization funds to all the three thousand or so public housing authorities. Why are you proposing this expansion of the current program when funding seems to be inadequate to take care of the problems faced by the public housing authorities you are currently funding?

Answer: The proposed Modernization Comprehensive Grant program also is a "needs-based" program. For current needs, the funds would be divided into two accounts. One account would provide funds for medium size and large Public Housing Agencies (PHAs) with 300 or more units and the other account would provide funds for both small PHAs with less than 300 units and Indian Housing Authorities (IHAs). The amount available for medium size and large PHAs would be allocated by formula based on the distribution of current modernization needs as determined by the Abt Study. The amount available for small PHAs and IHAs would be available on a simplified application basis. Because the current funding needs of smaller PHAs are more likely to be idiosyncratic (e.g., either no needs or concentrated needs for a given project or two), formula funding might provide less money than is needed by some small PHAs and more than is needed by others.

The Modernization Comprehensive Grant program will be an expansion of the current Modernization program because it also would provide funds for the ongoing accrual of capital improvement needs. This distribution of funds also would be based on a formula utilizing the study data and would attempt to project levels of future need. All PHAs/IHAs would be eligible to receive such funds. The purpose is to prevent the continuous growth of a backlog of modernization needs and make it possible for PHAs/IHAs to stay current with their needs.

The proposed Public and Indian Housing Modernization Comprehensive Grant program has two basic objectives: (1) significant deregulation of the Public Housing program and greater local control over timing and location of capital improvements, and (2) reliability and predictability of funding capital improvements through use of formula funding for the annual accrual of both capital improvement and current needs. The Department believes that the Comprehensive Grant program will prove to be significantly more efficient in the management and use of funds than the current discretionary Comprehensive Improvement Assistance Program (CIAP). Under the proposed Comprehensive Grant program, PHAs/IHAs will set priorities among projects instead of responding annually to a new set of HUD priorities. They also will make determinations as to whether maintenance or replacement is necessary instead of being pushed toward unnecessary replacement because of the availability of modernization funds for capital improvements. Further, time consuming reviews and approvals by HUD would be greatly reduced for well-run PHAs/IHAs.

NEED FOR MODERNIZATION COMPREHENSIVE GRANT PROGRAM

Question: Why are you proposing a new program before the Abt study is completed?

Answer: The draft version of the Abt Study National Estimates Report has been completed. The remaining components of the study will follow soon. The Department believes that it is very important to utilize a highly efficient program delivery system to meet the modernization needs identified by the study so that there will be the maximum benefit possible from the funds to be devoted to that purpose.

The current Modernization program is an inefficient way to distribute resources for the capital improvement needs of the Public and Indian Housing inventories. It denies Public Housing Agencies (PHAs) and Indian Housing Authorities (IHAs) the flexibility and responsibility essential to set priorities for capital improvement expenditures by weighing the needs of all projects against each other and the options of repair and major maintenance against capital replacement. Since HUD decides what to fund and when to fund it based on the availability of funds appropriated by Congress, it is extremely difficult for PHAs/IHAs to do rational, multi-year planning for the capital improvement needs of the Public and Indian Housing inventories. The Comprehensive Grant program will provide the opportunity and incentives for efficient management by PHAs/IHAs.

SECTION 8 - OPERATING RESERVES

Question: As I understand it, under the Section 8 certificate program HUD pays public housing authorities (PHAs) 7.65% of the local two bedroom fair market rent for each month a unit is rented for administrative costs. On the other hand, PHAs are paid 6.5% of the two bedroom rent under the voucher program. If PHAs spend less than the amount provided by HUD for administrative costs they can either accumulate the excess in an administrative reserve account or use it for housing related purposes. Do you know how much has been accumulated in administrative reserve accounts?

Answer: Each PHA reports the amount of funds in its Operating Reserve account on a balance sheet submitted to HUD at the end of the PHA's fiscal year. The amounts accumulated in Operating Reserves will vary among the 2,000 PHAs, because each PHA's program size, staffing, overhead, jurisdictional area, operating procedures, and administrative efficiency are unique. In addition, since any PHA expenditure from the Operating Reserve could significantly change/reduce the balance, capturing a "balance" at any point in time is not meaningful information. The Department has not gathered these figures from current PHA balance sheets nor totalled them to determine the aggregate amount in Operating Reserve accounts.

Question: For what purpose do PHAs use funds from their administrative reserve?

Answer: PHAs must use funds in the Operating Reserve to pay any administrative expenses in excess of the earned amount. PHAs may use any remaining funds in the Operating Reserve for other housing purposes consistent with State and local law, provided that the PHA is adequately administering the program and that projected fees will cover administrative costs for the remaining ACC term. The Department does not track use of excess administrative fees (operating reserves); however, we know that many PHAs use excess Section 8 administrative fees to support Public Housing programs.

Question: Can you tell us how you monitor the expenditure of PHA administrative reserve funds to assure that they are spent for housing related purposes that are consistent with State and local laws?

Answer: Each PHA is responsible for determining whether expenditures using Operating Reserve funds are for housing related purposes consistent with State and local laws. The Field Offices also review PHAs year-end Operating Statements to analyze administrative expenditures and annual activity in the Operating Reserve accounts, and to determine the financial stability of PHAs as shown by balances in the Operating Reserve accounts. Our primary concern in monitoring use of administrative fees and Operating Reserves is to assure that the PHA is sufficiently staffed to administer the program in accordance with program regulations.

Question: What percentage of currently operating PHAs have been able to accumulate reserves?

Answer: The 2,000 PHAs operating the Section 8 Certificate program report their Operating Reserves in year-end financial statements submitted to our Field Offices. We do not have reliable data in Headquarters to calculate the percentage of PHAs currently reporting Operating Reserves balances.

Question: Is there any evidence that large PHAs accumulate more funds in their administrative reserves than small PHAs because of economies of scale?

Answer: There is no evidence that larger PHAs have accumulated more reserves than smaller PHAs. In 1981, an independent public accounting agency conducted a study for the Department on the effectiveness and adequacy of the administrative fee structure. The study did not establish the existence of economies of scale sufficiently to revise the fee formula based on that presumption.

Question: Has HUD considered the feasibility of basing its administrative fee on actual operating costs and doing away with the need for a reserve?

Answer: The Department has considered basing the administrative fee on actual costs, among other alternatives. We concluded that the current system is most appropriate and cost effective. The current fee structure rewards administrative efficiency by allowing the accumulation of an Operating Reserve fund which may be used by the PHA for its other housing programs. The current set fee system also limits HUD's liability for reimbursement for administrative costs which may be excessive. The present fee system is simple and straightforward. Basing the fee on actual costs would require more HUD administration in review and payment of PHA administrative expenses and is not cost beneficial.

Question: Has HUD considered handling administrative fees on a sliding scale that would adjust the fee in inverse ratio to the size of each PHA?

Answer: The Department has considered a sliding scale for administrative fees but rejected it. As noted previously, it has not been sufficiently established that there are economies of scale in the operation of the Section 8 certificate program. A sliding scale for administrative fees, in inverse ratio to the size of each PHA, presumes that steady economies of scale exist. The data on Operating Reserves do not support this presumption.

Question: As you may recall, in 1984 this committee directed your Department to submit a report of the costs of program administration for both the section 8 certificate program and the voucher program. This report was to be based on an analysis of actual program costs incurred by a representative sampling of current program administrators. The report was due by October 1, 1984. Was the analysis ever done, and if so, what did it show?

Answer: The Department sent a response to Senator Garn indicating that we could not provide a report within the time frames established in the Committee request. We indicated that research addressing the administrative costs of the Certificate and Voucher programs, for a sample of approximately 20 large PHAs, was underway by an independent contractor. The consultant's report is due by mid-summer 1987.

URBAN DEVELOPMENT ACTION GRANTS

Question: As one might expect, in cancelling 121 projects you saved the Government money. The Federal investment in UDAG projects over the life of the program fell from $3 billion last year to $2.9 billion this year. However, contrary to what common sense might dictate, the private investment in this reduced number of projects didn't fall, it rose from $17.4 billion on February 6, 1986 to $18.9 billion on February 6, 1987. Please explain the discrepancy.

Answer: The information contained in the above question was based on incorrect data provided on page D-5 of the Department's 1988 Congressional Budget Justification for the Urban Development Action Grants program. This information inadvertently included metro cities of under 50,000 population under the small cities column. The table below correctly delineates metro cities and small cities for this same information.

PRIVATE INVESTMENT AND UDAG FUNDS CUMULATIVE FROM BEGINNING OF PROGRAM THROUGH FEBRUARY 6, 1987

	METRO CITIES AND URBAN COUNTIES	SMALL CITIES	TOTAL	RATIO
	(Dollars in Millions)			
Number of projects....	1,527	1,245	2,772	
Amount:				
Private.............	$18,813	$7,256	$26,069	
UDAG................	3,160	1,082	4,242	6.15

The corrected table indicates that the amount of UDAG funding for metro cities/urban counties was $3,160 million and not $2,930 million.

ADP DATA ENTRY SERVICES

Question: You plan to spend $28.4 million for automated data processing in 1988, a decrease of $1 million below the current budget. I am wondering if this couldn't be cut even futher based on your Inspector General's report on data entry services. The IG found that you could have cut your data entry costs by $2 million between 1983 and 1986. Your budget justifications make no comment on savings in the data entry services area. Is there some reason why your ADP budget request can't be cut by about $500,000, the one year savings that would result from fully implementing the IG's recommendations?

Answer: The key punching contracts are Departmentwide, not just for Administration and Staff Services. The Department has implemented some of the findings of the Inspector General's report. For example, modifications have been made to existing contracts so that billings are based on actual keystrokes instead of average keystrokes per document. However, we do not believe that the actions implemented thus far have resulted in any significant cost savings. The Inspector General's recommendation that the number of data entry contracts be reduced in order to realize economies of scale will be implemented when the contracts are recompeted in 1988. Cost savings from this action, if any, would not occur until 1989.

The principal factor affecting keypunch costs is workload. Departmental costs increased to $2.1 million in 1986 in conjunction with the high volume of mortgage insurance activity. As a result of elimination of one major data entry requirement, Departmentwide keypunch costs are expected to decrease to $1.7 million in 1987. They are expected to temporarily increase to $2.2 million in 1988, due to a substantial backlog in data entry to be accomplished when the new Consolidated Single Family Statistical System is implemented.

The Department will continue its efforts to minimize data entry costs whenever possible by improving its methods of contracting for data entry services and by monitoring contracts. However, it would be premature to reduce the ADP budget for Administration and Staff Services by $500,000 in anticipation of savings which may not materialize.

FHA - FIELD OFFICE CLOSINGS

Question: Secretary Pierce, one of the hardest things for a Federal manager to do is to close a field office. Generally, I've tried to be supportive of attempts to reduce costs in this way because I know that it is one of the steps we have to take if we want to get Federal spending under control. However, recent GAO reports on your decision to close field offices in Springfield, Illinois, and Bangor, Maine, make me wonder about the standards you're using to mandate these closings.

The GAO found that (1) HUD had no written procedures for determining which offices to close, (2) the costs of closing the offices were understated while benefits were uncertain, and (3) the closings would adversely impact many lenders and borrowers.

Do you have any plans for setting guidelines for future field office closings?

Answer: The Department does not believe that written procedures would permit management the flexibility needed in changing circumstances to make sound decisions on which offices to close. Written procedures would, over time, either be too vague and all embracing or too restrictive and non-applicable to current conditions to be dependable.

The Department continues to support its position that managers must be able to evaluate on a case-by-case basis the changing factors that impact this important decision. In the case of Bangor and Springfield, the Department considered such factors as:

-- the number of FHA loan applications received by each Field Office as the primary factor;

-- the distance that lenders, who previously used an office, would have to travel to the next nearest HUD office;

-- the recommendations of the affected Regional managers and program officials; and

-- whether the office had at least one position that HUD considered to be excessive.

These factors may not be the ones evaluated whenever this decision is considered in the future.

Regarding the understatement of costs of closing the Offices, the GAO used entirely different data and assumptions from that of the Department and made them at a different time. Thus, it would follow that the results would differ. The Department used statistical information related to national averages from a study of a 1983 reduction-in-force. The GAO collected some costs as a result of the actual closings and projected other costs (severance and unemployment benefits) on the basis of the theoretical maximum which could be received. The Department's estimates were made prior to the closing and used national averages because it wanted to avoid the appearance of "targeting" individuals as to who would receive which benefits. The GAO was able to tailor its figures to the actual costs.

Regarding the uncertainty of benefits in the Bangor Office, GAO's main area of disagreement was the amount of savings to be realized in the area of communications and ADP services. The Department's estimate was $21,604; the GAO estimate was $12,827, but no details were provided for this difference.

In the Springfield Office, the GAO did not agree that the Department would save any staff positions, and so it disallowed any savings. The GAO also obtained estimates of the added costs of travel ranging from $0 to $60,000 and chose to use the larger figure even though there is no reason to believe that the Department would be authorized or require any increase in travel funds.

Question: Do you intend to close any Field Offices in fiscal year 1988?

Answer: No, the Department does not anticipate closing any Field Offices in fiscal year 1988.

GENERAL COUNSEL S&E

Question: You are requesting $14,574,000 for the salaries and expenses of the office of general counsel in 1988, a 3.2% increase from the current year. Can you explain why this office should receive a slight increase when you are proposing a 36% reduction in the overall budget of the Department?

Answer: The 3.2 percent, or $448 thousand, increase consists of $225 thousand for the full year impact of the 1987 pay raise, the further phase-in of the Federal Employees Retirement System (FERS), and other adjustments to average salary and benefits costs, and $223 thousand for ADP services for the development of several new modules to a case tracking system. There is no increase proposed in the staffing level for 1988 which remains level with 1987.

OGC staffing remains unchanged despite budget authority reductions in the programs since legal issues do not vary with program levels. Budget reductions in subsidized housing budget authority, for example, reflect changes in methods of financing rather than reductions in units assisted. And CDBG reductions do not reduce the numbers of recipients--just the amount of money per recipient.

Question: Your justifications contain detailed breakouts of the grade levels in the various offices of the General Counsel. For example, the Office of Assisted Housing and Community Development has 37.5% of its staff at the GS/GM-15 level and the Office of Legislation and Regulations has 13.8% at the GS/GM-15 level. It seems there is some top-heavyness in a few of these offices. Can you explain?

Answer: Staffing needs vary depending on the type of work handled by an office. For example, the Office of Assisted Housing and Community Development needs a cadre of experienced attorneys in the UDAG program to handle negotiation of complex financing arrangements with municipal and private financial experts and the drafting of related documents. The Office of Insured Housing and Finance also needs experienced attorneys to handle complex housing finance issues. Similar expertise is not required in the drafting of legislation and regulations or the handling of some types of litigation so that the Offices of Legislation and Regulations and of Litigation have been able to utilize less experienced lower grade attorneys.

GENERAL COUNSEL STAFFING LEVELS

Question: The Office of General Counsel proposed to maintain current staffing levels in 1987, employing 225 staff-years. In 1980, the last time I chaired this subcommittee, General Counsel asked for 240 staff-years. In these 6 years, General Counsel staff levels have shrunk only 6%. In the mean time, your total budget authority has gone down 75%. How do you explain the relatively high staffing levels in the General Counsel's office, considering the dramatic decline in your program funding?

Answer: The demand for legal services within the Department has remained fairly constant notwithstanding the cut in budget authority. Other activities of the Department including overseeing management of public housing units, approving transfer of physical assets of FHA projects, pursuing debt collection and administrative sanctions for fraud and implementing the public housing desegregation task force, have presented legal issues that have absorbed the attorneys' time. In addition, the new programs introduced during this time, e.g., Rental Rehabilitation Grants, while not funded at the levels of prior programs, require a certain investment of attorney resources no matter what the level of funding.

PHOTOCOPYING

Question: Sometimes, too sharp a pencil and too focused an eye will bring to light budget trivia of little consequence. However, occasionally such a point will lead to significant savings for the government. On page I-6 of your third volume of justifications you indicate that you reproduce some 23,000,000 pages of material at your quick-copy centers each year. This figure, when divided by the number of full-time appointments, leads to a figure of nearly 2,000 pages per person per year. Why is so much copying necessary?

Answer: We have taken a number of steps to reduce the costs of our central quick-copy capability, including some which are aimed at reducing the number of copies produced. These include:

-- reducing the number of centers from two to one;

-- reducing the number of high speed copiers from 29 to 13;

-- establishing a ceiling of 99 copies (we are considering reducing that ceiling to 50 copies); and

-- installing control devices on the copiers to ensure that they will not be used by unauthorized personnel during non-duty hours.

These actions are in part responsible for the reduction of nearly two million pages copied during the first half of 1987 as compared to 1986--10,222,969 versus 12,200,254. We have, and are continuing, our on-going education of staff on the proper use of copying equipment and encouraging them to have materials printed in lieu of making quick copies where feasible.

A reconsideration of our estimates, which takes into account the foregoing, indicates that our projections of the number of pages which will be printed in 1987 and 1988 were too high. It now appears that those estimates could be reduced by a minimum of 3,500,000, and, thus, we now expect a level of approximately 19,500,000 during each of those years.

FIELD LEGAL SERVICES S&E

Question: You have requested $12,985,000 in salaries and expenses for Field Legal Services, an increase of 1.3%. It is difficult to establish the need for increases, much less decreases in this budget element, as your justification gives no measure of the actual work load you now service, or future work loads. Can you tell me what affect it would have on your operations if you took a 10% cut?

Answer: A 10 percent cut would clearly impact on the level of Field legal services. Legal reviews and contract preparation would take longer, including preparation of the Voucher contracts which is a Departmental priority. In addition, debt collection and administrative sanction actions would have to be curtailed and the effort to undertake affirmative litigation to curb program abuses would be halted. Another impact a 10 percent cut in staffing would have is to force us to withdraw on-site legal services from some of the smaller offices. We have already done this in several cases and, needless to say, it has not been popular. In fact those offices affected still hope to regain an on-site attorney.

In the last 5 fiscal years, including fiscal year 1987, Field Legal Service's staffing allocation has already decreased nearly 10 percent from 266 full-time permanent (FTP) positions in fiscal year 1983 to 245 in fiscal year 1987. At the same time, several significant work items have been added to legal staff's responsibilities. These items include the review of title evidence for all assignments and some conveyances, preparation of mortgage satisfactions for Title II cases, the handling of Title I defensive foreclosure litigation, the review of Housing Development Grant applications and legally binding commitments, and the review of work plans and Title VI compliance reviews in support of the Department's efforts to desegregate public housing projects. At the same time the legal staff's involvement in debt collection, primarily Title I and bankruptcy cases, has increased significantly. In addition, the number of administrative sanctions has risen, as has legal staff involvement in these actions. In some cases, this includes a Field attorney's handling of formal hearings resulting from Temporary Denials of Participation. The Headquarters staff of the Office of General Counsel (OGC) and the field legal staff have begun an effort to undertake affirmative litigation and in the past few months cases have been sent to the Field for handling. However, it is unlikely that these actions could continue if there is a cut in staffing.

Question: Would you please provide for the record a breakdown of your workload under the Field Legal Services element covering the last two years, and a projection of your workload for the next three years?

Answer: The following listing indicates the actual numbers of selected workload items processed by Field Legal Services staff during fiscal years 1985 and 1986. It does not indicate all workload items, particularly that of providing advice and counsel to appropriate staff members on unique issues which can become quite complex. Other activities for which Field Legal Services staff are responsible are discussed in the Field Legal Services section of Volume 3 of the justification material provided separately. However, the items identified represent a substantial portion of the workload which is of an on-going nature and not expected to vary significantly during the next few years; therefore, no specific estimates are provided for the next 3 years.

Selected Field Legal Work Items
Workload Statistics

MULTIFAMILY	FY 1985	FY 1986
Insured Closings	706	705
202 Closings	617	601
202 Applications	1,312	1,261
Transfer of Physical Assets Reviews	2,544	1,333
Property Disposition Closings	115	81
Foreclosures Initiated	47	90
SINGLE FAMILY		
Review of Title Evidence for Assignments	8,132	10,260
Review of Title Evidence for Conveyances	530	619
Preparation of Mortgage Satisfactions	...	2,003
Review of Deeds-in-Lieu	349	441

	FY 1985	FY 1986
Review of Planned Unit Development/Condominium, and Subdivision Documents	647	708
PUBLIC HOUSING		
Review of Applications or Proposals	847	768
Preparation/Review of Declarations of Trust	314	254
Preparation of Annual Contribution Contracts (ACCs) and Amendments	2,236	2,208
Conflict of Interest Opinions	261	328
ASSISTED HOUSING		
Housing Development Grant Reviews	...	115
Preparation of Section 8 ACCs and Amendments	4,559	3,481
Preparation of Housing Assistance Payment (HAP) Amendments	1,118	1,383
Review of Leases	312	348
Review of Applications for Section 8 Programs	2,131	1,552
Review of State Housing Finance Agency Documents	356	429
LITIGATION		
Cases Filed	321	319
UDAG		
Review of Applications	223	255
Review of Legally Binding Commitments	767	545
Preparation/Review of Closeout Agreements	400	319

	FY 1985	FY 1986
OTHER		
FOIA Requests	2,616	2,642
Title I Claims	1,877	1,949
Bankruptcies	1,390	1,863
Section 312/Title I Releases	1,598	1,078
Administrative Sanctions	456	728

ADP SERVICES FOR ADMINISTRATION AND STAFF SERVICES

Question: On page E-2 of your justifications you indicate that data processing costs went up by $3.7 million in 1987 due to the continuing high volume of mortgage insurance activity. In 1988 you plan to reduce these costs by $1.1 million. How did you arrive at your estimate of reduced mortgage activity?

Answer: The $3.7 million increase to which you refer is the difference between the actual costs incurred during 1986 and the 1987 current estimate. The 1987 increase is primarily to fund systems development costs required to improve single family mortgage insurance and servicing systems. The $1.1 million reduction in 1988 reflects completion of some development projects and a lower level of new development planned for single family mortgage insurance and servicing systems next year, as well as reduced mortgage activity, as reflected on pages J-1 and J-4 in Volume 1 of the Justifications.

OFFICE OF SMALL AND DISADVANTAGED BUSINESS UTILIZATION

Question: Your Office of Small and Disadvantaged Business Utilization has just about doubled its staff over the last 12 months, going from 5 positions to 9 positions. Can you tell us why?

Answer: The increase in staff results from the transfer of the Minority Business Enterprise (MBE) program function and staffing from the Office of Fair Housing and Equal Opportunity to the Office of Small and Disadvantaged Business Utilization (OSDBU) to provide for more effective coordination of MBE activities within the Department. This transfer occurred during fiscal year 1986 and was documented in memoranda of December 2, 1985 to the then Chairman and Ranking Minority Member of this Committee.

This effort has increased productivity and improved management efficiency in carrying out the Secretary's priorities and objectives relative to participation of socially and economically disadvantaged groups in HUD procurement and program activities.

The transfer of the four (4) full-time permanent positions to OSDBU as part of this consolidation of related activities did not result in an increase in overall Department staffing.

CASH TRANSACTIONS

Question: The workload of your Insurance Accounting Division under Administration and Staff Services has jumped way beyond last year's initial projection, probably because of the surge in business caused by dropping interest rates. For example, last year you projected 109,372 cash transactions in 1987. Your current estimate is 349,393 cash transactions. However, Insurance Accounting Division staffing will have remained at about 51 between 1986 and 1988 if we honor you budget request. Can you tell us how you are able to process so much work without an increase in staff?

Answer: The difference in workload levels projected in the 1987 Budget and in the current estimate is misleading in that it seems to indicate a monumental increase in workload in this area. This is not the case. Prior to 1986, we counted each cash transaction as a separate item. Beginning with the workload figures shown in the 1986 Budget, we began counting the total number of documents processed, many of which included more than one cash transaction. Because we felt that this method did not accurately reflect the volume of work accomplished in this area, we have since returned to counting individual cash transactions. Therefore, even though the projections shown in the 1988 Budget are higher, actual workload is not expected to change significantly. We believe that the requested staffing level is sufficient for that workload.

FINANCIAL REVIEWS

Question: Last year's justifications indicated that you expected your Assisted Housing Accounting Division to make 21,000 financial reviews in 1987. Your current estimate for 1987 is a mere 3,500 reviews. Can you tell us why your workload projections changed so dramatically?

Answer: The difference in projected financial reviews does not reflect a drop in workload. Rather, it reflects a different method of counting accomplishments. The 1987 Budget figure of 21,000 represents the total number of projects under the jurisdiction of Public Housing Authorities (PHA's) to be reviewed. The lower figure of 3,500 in the 1988 Budget represents the number of PHA's to be reviewed. We believe the latter more accurately reflects how we do our work because financial statements from the PHA's are reviewed as consolidated sets, rather than as individual projects. There is no change in the work being done, nor in the staff required to handle it.

ADMINISTRATION AND STAFF SERVICES

Question: The originally projected workload of your Communications and Space Management Division has dropped far below initial projections. Last year you expected to conduct planning for 2.9 million square feet of space in 1987 and this year's 1987 estimate has dropped to 1.6 milion square feet of space. Can you tell us why your initial projection was so wide off the mark?

Answer: The initial 1987 projection of 2.9 million square feet of space was based on the assumption that one to four centers to service Departmental administrative activities would be established and that the Department's computer facilities would be relocated outside of the HUD Headquarters building, requiring subsequent major space realignments within the building. The estimate was revised downward when it was decided that these plans would not be carried out in 1987.

Question: The staffing of your Communications and Space Management Division stays the same, despite the drop in workload. Why can't you achieve some staff savings in this area?

Answer: No additional staffing was requested for the workload increase, as described above, because we anticipated using contractors and GSA services for these purposes. Our current staffing of 21 full-time permanent appointments will continue to carry out regular space management requirements.

FIELD ADMINISTRATION S&E

Question: The Field Administration salaries and expenses request is $66,862,000, $5,406,000 more than the current year. Of this increase, 93% is associated with increased space costs. I know that you have no control over the rates that GSA sets for space, but this represents a 21% increase in a single year. Is there no cheaper space available, is there no room for negotiation with GSA, and are these increases realistic in the context of actual costs?

Answer: Approximately 40 percent of HUD's Regional Headquarters and Field Offices are located in centrally located Federal buildings. The remaining 60 percent are located in leased space acquired competitively by the General Services Administration (GSA) and within the central business areas of cities. The rate structure for Federal buildings is based upon that of the private market and, thus, there are no significant differences between the rents charged for Federally owned or leased space.

The 21 percent increase reflects the fact that the Standard Level User Charge (SLUC) rates were frozen for several years prior to fiscal year 1987. In fiscal year 1987, increases were permitted when GSA replaced the SLUC system with the Rent system. Because the rates, based on 1987 appraisals, were much higher than what the Department (as well as other agencies) had been paying, GSA was ordered by the Office of Management and Budget to apply only 85 percent of the increase in 1987, and the balance in 1988 with any further inflationary increases.

Under the Rent system, HUD is provided fully documented and detailed information as to how the rates were developed in comparison to other buildings in the area and to what services are included. We have the opportunity to discuss the Rental rates with GSA and seek adjustment if the rates appear out of line. Experience has shown, however, that estimates in relation to actual costs have been relatively close.

TRANSITIONAL HOUSING DEMONSTRATION PROGRAM

Question: Focusing on just the Transitional Housing Demonstration program, you indicate in your justification that you will compare the benefits and costs associated with this type of housing and supportive services to the homeless. What objective measures will you use in this comparison?

Answer: In evaluating the costs and benefits of the Transitional Housing Demonstration program we must consider two major issues: efficient use of Federal funds and effective use of Federal funds. To achieve these objectives, measures have been incorporated in the threshold criteria and the ranking criteria stages of the selection process.

Efficient use of Federal funds under the program is accomplished through the requirement of non-Federal dollars to be leveraged for each demonstration project. Under the threshold criteria, a 50 percent leverage of non-Federal funds is required for each project under each category of assistance in order to be considered for receiving a matching 50 percent of Federal funds (not to exceed $200,000 for acquisition/rehab. cost). By having this threshold requirement, monies from non-Federal sources are used for transitional housing which otherwise might not have been used for this purpose. Furthermore, the threshold criteria require the commitment of new funds by the applicant in order to satisfy the leveraging requirement. Therefore, in the case of an applicant operating an existing homeless facility and proposing to use program funds to substantially increase the number of homeless persons for whom transitional housing would be provided, the resources necessary to maintain and operate the program at its current level would be excluded from the leveraging calculation. Finally, since the applicant must leverage at least an equal amount of funds from non-Federal sources in order to be considered for Federal funds, the leveraging criteria places the burden upon the applicant to ensure that the costs for the proposed project are reasonable.

The ranking criteria stage of the selection process reinforces the importance of the use of non-Federal monies for a proposed project. During this stage, numerical values are assigned to award more credit to applicants leveraging non-federal funds in excess of the 50 percent leverage requirement established in the threshold criteria. The ranking criteria provides incentive for applicants to leverage a greater amount of non-Federal funds in proportion to federal funds requested for a project. Similarly, points are assigned and applications ranked based on the reasonableness of the costs of a proposed project. The efficient use of federal funds under the program is thereby objectively measured in selecting recipients based on threshold and ranking criteria.

Measures to ensure that Federal funds are spent effectively are included in the threshold and ranking criteria stages in the selection process. The threshold criteria requires the applicant to have demonstrated past experience in providing housing or services to any group. The ranking criteria provides further scrutiny of the applicant's ability to establish and operate transitional housing by assigning numeric values to award those applicants with the greatest emphasis on experience in providing housing and supportive services for the homeless. In tandem with the applicant's ability to operate such a facility, the innovative quality of the proposal and use of other entities to provide supportive services are ranked with point values to ensure that the applicants who will use the Federal funds most effectively in a community are given priority over other applicants who fail to do so. The program recognizes experience, innovation, and use of existing community supportive services to ensure effectiveness of the program.

Question: How will you determine if these demonstration projects are successful?

Answer: The Demonstration program is designed to fund projects which serve a cross-section of the homeless population. Factors to be considered when selecting recipients for the program include: the type of project proposed; the subpopulation which is to be served by the project; and the geographic location of the project.

Considering these factors, the desired result of the selection process is to select a variety of projects which can provide transitional housing and supportive services for homeless persons capable of moving into independent living within a reasonable amount of time. A time frame of 18 months was determined as reasonable based upon consultations, conducted nationwide by HUD program officials, with individuals having expertise regarding homeless persons. However, it also was determined, based on these consultations, that different subpopulations of homeless require different time frames to make the transition into independent living. For example, battered women may require anywhere from 12 to 18 months since they often have not worked outside the home and might require job training to obtain employment and to make the transition. In contrast, alcoholics may already have job skills and could make the transition within a much shorter time with minimal supportive services such as a 6-month detox. program.

Variables of subpopulation, geographic location and types of projects in the program make it impossible to calculate a quantitative formula to measure the success of the projects. Specifically, success of the program cannot be measured by comparing all projects based on the number of residents who make the transition into independent living every month because no two projects will be identical.

Each applicant will provide a development schedule in their application which specifies a detailed time frame for the development of the transitional housing. The Department will monitor this schedule to assure that projects are developed expeditiously and funds reach the homeless population as quickly as possible. Applicants also will identify appropriate time limits which residents of their project will be required in order to make the transition to independent living. Based upon information submitted in the application process, a project will be selected and its success will be determined by how successfully residents achieve independent living within the agreed upon time frame and from the ability of the residents to avoid homelessness in the future.

AMHOIST AND UDAG

Question: The General Accounting Office (GAO) issued a report on February 12, 1986, concerning the award of a $4 million Urban Development Action Grant (UDAG) to the city of Wilmington, North Carolina, for the renovation of a vacant industrial plant to be used by the American Hoist and Derrick Company of St. Paul, Minnesota (AMHOIST) to manufacture cranes. In this report and during subsequent Congressional hearings, GAO stated that, in its view, the award represented a relocation and as such was a violation of the anti-pirating provision (Section 119(h)) of the Housing and Community Development Act of 1974, as amended. HUD concurred and in March 1986 referred the matter to the Department of Justice for resolution.

More than a year has passed since this matter was first referred to the Department of Justice but as of this date, the matter still has not been resolved. Accordingly, please provide a response to the following questions.

1. What is the current status of this matter, why has it not yet been resolved, and what is the expected date for resolution?

2. With respect to your attempts to satisfactorily resolve this matter, we understand that a number of proposals have been made by the Department to Amhoist. When was your first offer to settle made and what were the terms? When did Amhoist respond and what were the details of its response.

3. Have additional attempts been made to resolve this matter? If so, how many and when? Again, provide details on the basis for such revised offers and the reason why they were not accepted by Amhoist.

4. Assuming agreement cannot be reached to close this issue, provide information on what additional steps or remedies the Department has at its disposal and when it intends to take such steps or measures.

Answer: The response to the above stated questions is as follows: HUD referred the Amhoist matter to the Department of Justice in March of 1985. Since that time, HUD and DOJ have been involved in negotiations with Amhoist to resolve this matter outside of litigation. To comment at this time on the substance of the ongoing negotiations or the terms of any proposed settlements could jeopardize attempts to reach an agreement with Amhoist that is in the best interest of the Department.

HUD INVENTORY OF SINGLE FAMILY FORECLOSED PROPERTIES

Question: At the close of FY 1986, 25,506 foreclosed properties were in the HUD inventory. During that year, the HUD inventory expanded by 8,533 units, or over 33%. Just two years ago, in 1984, the HUD inventory totaled 15,754 -- almost 10,000 units less than the current inventory. At the close of FY 1986, 1171 units had remained in the inventory for over a year because HUD was not able too sell them -- privately or publicly. This buildup in the HUD inventory is national in scope.

The inventory could provide a source for cost-effective low-income housing. Currently, HUD sells almost all of the properties at a significant loss on the private market. While these sales continue, the Federal Government also spends money on maintenance expenses for property which languishes in the HUD inventory. It has been suggested that we tap the inventory as a source of permanent housing.

The Urban Homesteading program bought about 670 units from the inventory during 1987 at an average unit price of 17,700 and turned them over to low-income families as permanent housing. I'm interested in learning how many properties might be purchased from the inventory at bargain prices and what savings in HUD maintenance expenses would result from such purchases.

Question: How many units of the HUD inventory in 1986 were sold at prices under $10,000?

Between $10,000 and $20,000?
Between $20,000 and $30,000?
Between $30,000 and $40,000?
Between $40,000 and $50,000?
Between $50,000 and $60,000?
Between $60,000 and $70,000?
At higher prices?

Answer: The number of properties sold in FY 1986 were in the following price ranges:

	Properties
Under $10,000....................	5,045
Between $10,000 and $20,000......	6,323
Between $20,000 and $30,000......	6,559
Between $30,000 and $40,000......	6,394
Between $40,000 and $50,000......	5,411
Between $50,000 and $60,000......	4,209
Between $60,000 and $70,000......	2,771
At higher prices.................	2,695

Question: How many units of the HUD inventory in 1986 that had been in the inventory over 1 year were sold at prices under $10,000?

Between $10,000 and $20,000?
Between $20,000 and $30,000?
Between $30,000 and $40,000?
Between $40,000 and $50,000?
Between $50,000 and $60,000?
Between $60,000 and $70,000?
At higher prices?

Answer: The number of properties sold in fiscal year 1986 that had been in inventory over 1 year were in the following price ranges:

	Properties
Under $10,000	358
Between $10,000 and $20,000	429
Between $20,000 and $30,000	334
Between $30,000 and $40,000	295
Between $40,000 and $50,000	175
Between $50,000 and $60,000	119
Between $60,000 and $70,000	86
At higher prices	80

Question: What is the total yearly cost of local taxes, repairs, daily maintenance, and operation for property in the HUD inventory?

Answer: The average yearly costs for each property in HUD's inventory is as follows:

Taxes	$485.22
Repairs	1,904.65
Maintenance and Operation	596.45
Total	2,986.32

It should be noted that not every property is repaired; the decision is made on a case by case basis.

Question: What is the daily cost for these expense items per unit?

Answer: The average daily per property cost for these expense items are:

Taxes	$1.33
Repairs	5.22
Maintenance and Operation	1.63
Total	8.18

Question: Are there any other continuing costs related to holding properties in the HUD inventory? If so, what are their yearly cost and daily unit cost?

Answer: An additional holding cost is the staff time spent over-seeing the property disposition program in our Field Offices. We do not have detailed cost data for this expense. However, in addition to the holding costs, HUD incurs certain other expenses relating to the sale of the properties, i.e., real estate commissions, discount points and advertising costs. Our current average yearly sales expense for each property is $2,902.94.

Question: What portion of these costs to HUD can be avoided by early sale of title to non-HUD owners; for example, by sale to the Urban Homesteading Program within two months of entry to the HUD inventory?

Answer: Where HUD sells a property to a unit of local government or its designated public agency for use in Urban Homesteading programs, HUD can avoid the sales expense mentioned in the previous answer because these are direct sales. Holding costs for taxes, maintenance and operation will be reduced if the sale is completed sooner than it would have been if the property was offered for sale to the general public. Generally, a sale for an Urban Homesteading program is completed within 60 days, while the average time to complete a public sale is 8 months.

Question: What revenues per unit would be foregone if sales on all property currently in the HUD inventory for more than one year were stopped and the property was put to a public use such as Urban Homesteading?

Answer: Sales for Urban Homesteading programs are made at fair market value.

The proceeds from the sale of property under the Urban Homesteading program are realized from appropriations provided HUD for this purpose. Therefore, HUD does not forego revenues from the sale. However, the "Government" as a whole does not realize revenues from such sales and the sales volume is limited by the amount of appropriations.

Question: What costs per unit would be foregone if sales on all property currently in the HUD inventory for more than one year were stopped and the property was put to a public use such as Urban Homesteading?

Answer: As mentioned earlier, average sales expenses of $2,902.94 for each property and holding costs of about $8.18 per property per day would be avoided if the property is in inventory for a shorter period of time and the property is disposed under the Urban Homesteading Program.

QUESTIONS SUBMITTED BY SENATOR LAUTENBERG

UDAG AND RELOCATION POLICY

Question: In regard to the definition of pirating as it relates to the UDAG program, what are the Secretary's views on this matter?

I do not support the use of federal funds to move businesses and jobs from one city to another. However, I recognize that businesses do move, and for a variety of reasons. Reasons related to the cost of doing business -- an increase in rents, utility costs or taxes; the inability to expand at the present location -- any number of reasons.

Take the example of a manufacturer currently located in New York City who wants to expand. His rents have gone up 25% over the past two years. The manufacturing lofts around him are being converted into condominiums. His current location is too small and expensive. He decides to relocate his business.

He debates between the suburbs and the cities and chooses Newark, where a prospective UDAG-assisted project provides the most economical option for him. He moves his business into an economically-distressed area. New York City challenges the UDAG on the grounds of pirating.

How would you rule on this situation?

What criteria would you use in making your decision?

This manufacturer moved to a UDAG-assisted location because he had reached a decision to relocate and this location made the best economic sense to him. By moving to an economically-distressed area, he benefits that area by providing jobs and a solid economic base.

Wouldn't you agree that, in the case where a business has already made the decision to relocate, it is preferable in terms of the goals of the UDAG program that the business choose a distressed city over an affluent suburb?

Answer: Section 119(h) of the Housing and Community Development Act of 1974, as amended, provides that:

"No assistance may be provided under this section for projects intended to facilitate the relocation of industrial or commercial plants or facilities from one area to another, unless the Secretary finds that the relocation does not significantly and adversely affect the unemployment or economic base of the area from which the industrial or commercial plant or facility is to be relocated."

The statute does not proscribe the use of UDAG funds only when they cause the relocation. The statutory impediment applies to any assistance "intended to facilitate the relocation" of the plant or facility. In the hypothetical case presented in the question, the manufacturer "decides to relocate his business." UDAG funding in support of that decision, equally by hypothesis, is thereby "intended to facilitate" that business relocation. Accordingly, I would rule section 119(h) applicable. The motivation for the business relocation and the economic desirability of the site to which the plant is relocated do not affect the operation of the statute one way or the other. The grant simply cannot be used to facilitate such a relocation.

Certainly, the goals (as well as the structure) of the UDAG program are intended to influence firms "to choose a distressed city over an affluent suburb" for the location of new economic opportunities. However, in the hypothetical case the relocation of an existing operation to another community--distressed or not--is barred by the specific operating requirements of section 119(h).

AFFORDABLE HOUSING

Question: The number of homeless people in our society is unconscionable. Recent estimates, which are not precise because of the nature of homelessness, put the number of homeless people in our country at between 2 and 3 million.

Until recently, many people preferred to think of the homeless, when they thought of them at all, as society's misfits--people who were unwilling to take advantage of the shelter services available to them.

While there are certainly some people who fall into that category by reason of mental illness, drug addiction, or a variety of other causes, these individuals do not account for the growing numbers of homeless in our cities.

We are seeing entire families who have lost their homes and are going to shelters. Women and children are taking refuge in temporary housing.

Shelter is one of our most basic requirements for life. As the executive with responsibility for our nation's housing programs, you need to combat this problem.

One of the main causes of homelessness is the shortage of affordable housing stock. Do you feel that the nearly 50% cut in the budget for Section 8 assisted housing in 1988 is consistent with the need to provide additional affordable housing?

Answer: The Department's Budget proposal for fiscal year 1988 is entirely consistent with the need to provide additional affordable housing. The Housing Voucher program is the key to providing additional affordable housing through the utilization of the existing housing stock. The Voucher program enables eligible Voucher holders to rent units of their choice with HUD providing a subsidy for the difference between 30 percent of adjusted income and the effective payment standard for the area. This immediately makes housing available which previously had been beyond the reach, financially, of very low-income families.

Because the Housing Voucher program utilizes the existing housing stock instead of providing subsidies to develop assisted housing projects, the Voucher program is much more cost efficient. It is this cost efficiency that is reflected in the 1988 Budget proposals. The 1988 Budget proposed an appropriation of $3.9 billion of budget authority for assisted housing with a reliance on the Housing Voucher program. Of the 100,000 unit reservations proposed for 1988, 84,500 reservations are Housing Vouchers. The 1987 Appropriation Act provided an appropriation of $7.8 billion to fund 98,000 units (99,612 units utilizing carryover), including 53,000 Housing Vouchers. The 1988 Budget estimates indicate that a greater reliance on the Voucher program would require significantly less budget authority and also provide an increased level of additional families served.

EMERGENCY SHELTER GRANTS PROGRAM

Question: Do you intend to seek additional funding for the Emergency Grants Program?

Answer: No additional funding is proposed specifically for the Emergency Shelter Grants program beyond 1987. The 1988 Budget proposes that the $10 million provided to HUD in 1987 be shifted to FEMA's Emergency Food and Shelter Program in 1987.

TRANSITIONAL HOUSING DEMONSTRATION FUNDING

Question: What level of support will you seek for the Transitional Housing Demonstration Program?

Answer: The Budget requests $5 million for this demonstration in 1988. This would bring total funding for the demonstration to $10 million.

PENDING HOMELESS LEGISLATION

Question: What is your position on the homeless legislation pending before the Congress?

Answer: We oppose H.R. 558 because it establishes costly and duplicative new programs. It also establishes a dominant Federal role, where State and local governments are better able to identify accurately and respond to the needs of the homeless in their communities.

We continue to believe that the best way to assist the homeless is to assure that they receive the assistance for which they are eligible from Federal programs that are designed to assist the poor.

Instead of new layers of bureaucracy and costly new programs, the Federal Government can more appropriately address the needs of the homeless by eliminating red tape in the delivery of services and by providing resources to State and local governments for programs designed to meet the needs of the local homeless population.

LOW SUPPORT LEVELS FOR ASSISTED HOUSING

Question: How do you reconcile the low support levels for housing programs in your budget with the crisis of affordable housing we see in our cities?

Answer: Although the budget authority proposed for 1988 ($3.9 billion) is a significant reduction from the 1987 Appropriation ($7.8 billion), the proposed 1988 program level in the number of units estimated to be reserved reflects an increase from the level provided in the 1987 Appropriation Act. This is accomplished by an emphasis on the Housing Voucher program which is noted for its cost efficiency and was designed to particularly address the affordability problem.

VOUCHERS AND AFFORDABLE HOUSING

Question: Your heavy reliance on vouchers is supposed to compensate for the amount of aid you proposed to cut. In New Jersey, where there is a serious shortage of affordable housing, how will vouchers address the need for additional units?

Answer: The Housing Voucher program was designed to address the affordability problem. By providing a subsidy which reflects the difference between 30 percent of the adjusted income of the eligible tenant and the effective payment standard for the area, very low-income families are able to rent existing rental housing units which were previously unaffordable.

In those particular areas where there is a shortage of available rental housing, (including New Jersey), other HUD programs, such as the Rental Rehabilitation and Community Development Block Grants programs, can help local efforts to increase the supply of rental units.

DISTRICT HEATING AND COOLING

Question: The Secretary's Discretionary Fund has been used to finance grants for municipal district heating and cooling projects. Do you plan to fund such grants in FY 1988?

Answer: The Department has funded a number of District Heating and Cooling (DHC) technical assistance grants in the past, having committed more than $2.7 million in DHC grants and DHC assistance from fiscal years 1981-1987. HUD anticipates that it will continue its support of communities' DHC efforts in fiscal year 1988; however, no decision has yet been made on direct funding. The form of assistance--grants, use of a third party technical assistance provider, or some other means--is being evaluated at this time.

QUESTIONS SUBMITTED BY SENATOR GARN

CURRENT SERVICES OUTLOOK

Question: There is a basic problem in Congressional review of housing programs in that politicians are notoriously short-sighted and housing activities longer-term investments.

Your budget justification outlines the significance of this problem in its table entitled "Current Services Budget Authority." It shows that merely maintaining existing activity levels will grow in cost from $8.4 billion in FY 1987 to $10.1 billion in 1990. In 1991, however, this cost will skyrocket to $35.5 billion.

Please explain the reasons for this three fold increase, and also outline the assumptions used in developing these estimates.

Answer: The significant increase in current services budget authority required in 1991 reflects a continuation of subsidized housing for all tenants. Since current contracts begin to expire in 1990 and 1991, the out-year figures reflect the Section 8 subsidized housing units affected by the expiration of contracts. In 1991, it is estimated that $25.2 billion of budget authority would be necessary to refund 302,847 units. This figure assumes that units would be renewed utilizing in-kind assistance, for example, renewing moderate rehabilitation with moderate rehabilitation assistance rather than replacing all of the Section 8 unit expirations with vouchers. This "current policy" assumption differs from the Administration's proposal which would protect tenants with vouchers. Under the Administration's proposals, the 1991 Budget authority for Housing programs would be $11 billion.

PHA/IHA INSURANCE

Question: Last year we provided additional funds in the Operating Subsidy account to help PHA's meet rapidly escalating insurance premium costs. This amount is the balance of account after paying for PFS requirements and adjustments for excess utility payments. What is your currently estimated balance for this fiscal year?

Answer: A total of $1,523.1 million is available for Operating Subsidies in fiscal year 1987. This exceeds the current estimate of Performance Funding System (PFS) requirements by $135.3 million. The Department is in the process of assessing more current data and will be able to develop a better estimate of 1987 requirements shortly.

Question: The Department has indicated its interest in capitalizing proposed PHA captive insurance companies rather than making direct disbursements to PHA's. What are the reactions to this proposal from the three major PHA organizations: CLPHA, PHADA, and NAHRO?

Answer: The Department supports the formation of Public Housing Agency (PHA) and Indian Housing Authority (IHA) sponsored insurance entities that operate on a non-profit basis. These entities may be self-funded pools, captive insurance companies or reciprocal exchanges. They all serve the same purpose and differ only in legal format. Because self-funded pools are exempt from State regulation and taxes, the Department must have direct oversight of their operations to be sure they remain financially sound. These pools normally are organized on a State-by-State basis. The Risk Retention Act of 1986 permits captive insurance companies and reciprocal exchanges to be domiciled in one State with authority to operate in all States. However, the State of domicile will tax and regulate the entities.

The Council of Large Public Housing Authorities (CLPHA) is forming a captive insurance company in Vermont and the National Association of Housing and Redevelopment Officials (NAHRO) is forming a reciprocal exchange in Texas. Both organizations will offer liability coverage in all States. Both CLPHA and NAHRO plan to offer their programs to PHAs by June 1987. The Public Housing Agency Directors Association (PHADA) has not been active in forming a PHA insurance entity.

The Department plans to provide additional funds to PHAs/IHAs for necessary fiscal year 1987 insurance costs from Operating Subsidy funds remaining after all fiscal year 1987 basic Operating Subsidy requirements have been met. Such funds would be provided directly to the PHAs/IHAs and not to the insurance entities. Although CLPHA and NAHRO would prefer that the Operating Subsidy funds be distributed directly to them for insurance entities, they have accepted the fact that this is not legally possible and HUD must provide the funds to the PHAs/IHAs and they, in turn, will purchase their own insurance coverage.

Question: How will such capitalization assist those PHA's which are covered by State pools, or for other reasons will not participate in these new captive insurance programs?

Answer: Participation in the PHA/IHA entities is voluntary. PHAs/IHAs are free to purchase insurance from any entity, private or otherwise, as long as that entity meets the requirements of Section 305 of the Annual Contributions Contract. The distribution of any available Operating Subsidy funds will be made to all PHAs/IHAs on an equitable basis regardless of size or source of coverage.

Question: Will the full amount anticipated to be in excess of fiscal year 1987 PFS requirements be disbursed for insurance costs? If not, please provide a detailed explanation.

Answer: The Department plans to distribute as much as is required of the excess Operating Subsidy funds for fiscal year 1987 insurance. At this point in the fiscal year, we are not yet able to determine how much that will be. The balance will be used for costs beyond control or other requirements resulting from litigation. Because all PHAs/IHAs have been affected by increased insurance costs which have exceeded the amount included in the Performance Funding

System (PFS) formula, it is not administratively feasible to determine for each PHA/IHA how much the PFS provides for insurance or how much PHAs/IHAs would be charged for a standard insurance package per unit. Therefore, the most equitable distribution wil be achieved by: (1) developing an estimate of the total amount needed for insurance requirements based on the difference between the 1987 estimated insurance premiums to be paid by a representative sample of PHAs/IHAs and the amount provided these PHAs/IHAs by the PFS; and (2) dividing that total by the total number of units to determine the per unit subsidy. The result will be multiplied by the number of units each PHA/IHA owns. PHAs/IHAs will be notified of their amount and they will be authorized to submit their requests, pursuant to 24 CFR 990.108(d), in the form of a revision to their approved budgets. In this manner, a 50 unit PHA/IHA will receive the same pro rata share as provided to a 2,000 unit PHA/IHA.

HOUSING PROGRAM EFFICIENCY

Question: Yesterday, the Chairman questioned the efficiency of the Voucher program in assisting families seeking shelter. The data he was using indicated that essentially the total rent charged the family and the Government was higher than that charged under the Section 8 Certificate program.

Underlying this concern is the much broader issue of how to maximize the return for Federal assistance in terms of securing adequate shelter across the gamut of existing and proposed Federal programs. There are many factors involved--duration, cost to the family, other Government subsidies--including tax expenditures and operating subsidies.

Public Housing, for example, while expensive to develop, is dedicated to lower income family use for the life of the project. Tenants pay no more than 30 percent of income but other costs are involved including operating subsidies and modernization.

Section 202 Housing, also new development dedicated use projects are subsidized through not only Government loans, but also 20 year Section 8 contracts.

Has the Department tried to comprehensively compare these differing housing programs on the basis of cost efficiency?

Answer: There have been numerous comparisons made regarding the efficiency of the various assisted housing programs, including some of the research done under the Experimental Housing Allowance Program (EHAP), research on benefits and costs under the Section 8 program, and research on the costs of subsidizing multifamily housing development. The Housing Voucher research now underway will allow for detailed comparisons regarding the efficiency of Certificates and Vouchers once we have data on the quality of housing occupied under these programs. The earlier research indicates that utilizing the existing stock of housing provides significant benefits to participating families, and at about half the cost (in terms of outlays) of development programs. Given that development programs often generate additional "tax expenditures" (in addition to outlays), it becomes clear that development programs are quite expensive and should be used only in cases where less expensive solutions, such as Housing Vouchers, are proven to be infeasible.

Advocates of the development programs argue that it is useful to "lock in" assisted housing for 10 to 40 years, using such mechanisms as the public housing program. But the purchase of this "guarantee" is one of the factors that makes development programs so costly. By controlling rents and guaranteeing payments of rents for such periods of time, there are many different points in the process at which inefficiencies arise. It is less complicated and more efficient to pattern housing assistance programs after the private market, rather than in total opposition to it. For example, the Housing Voucher program leaves most of the relationships in the private market intact, but boosts the capacity of participating families to afford good quality rental housing. And, in areas where there are significant numbers of poor quality housing units, the Rental Rehab program can be used to boost the overall quality of the stock of housing available to voucher holders, but without controlling rents or requiring long-term subsidy commitments. This same approach could be used to support new construction in those special cases in which the higher per unit costs associated with development of new housing are warranted. The Administration's most recent budget proposes broader use of Community Development Block Grant (CDBG) funds in support of such housing development efforts.

HOMELESS AUTHORIZATION BILL

Question: This afternoon the Banking Committee will be marking up the Senate Homeless Authorization Bill. Does HUD have any specific problems or recommendations on this measure?

Answer: On April 2, 1987, J. Michael Dorsey, General Counsel of HUD, wrote to Senator Proxmire, the Chairman of the Committee on Banking, Housing and Urban Affairs, to explain HUD's views on S. 810, a bill "To authorize housing assistance for homeless individuals and families." HUD's position on the issues involved are discussed in the letter, a copy of which has been provided to the Committee.

THE GENERAL COUNSEL OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, D.C. 20410

APR 2 1987

Honorable William Proxmire
Chairman
Committee on Banking, Housing and Urban Affairs
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

This letter represents the views of the Department of Housing and Urban Development on S. 810, a bill "To authorize housing assistance for homeless individuals and families." The bill is drawn from title IV of S. 809, the "Urgent Relief for the Homeless Act." Title IV contains a number of housing assistance initiatives for the homeless for fiscal years 1987 and 1988. Although we share the Committee's concern that appropriate measures be taken to assist the homeless, we oppose enactment of S. 810 as drafted for the following reasons:

1. Budget Add-ons. The bill authorizes an additional $225 million in budget authority for HUD programs for fiscal year 1987: $60 million for the Transitional Housing Demonstration program; $80 million for the Emergency Shelter Grants program; $50 million for Section 8 Certificates; and $35 million for the Section 8 Moderate Rehabilitation program. We strongly oppose these funding levels. If Congress decides to make additional funding available, offsets from other amounts must be found.

2. Comprehensive Homeless Assistance Plan. Section 1 of S. 810 would require each State, city, or urban county, as a condition of receiving assistance under the Emergency Shelter Grants program, to prepare a comprehensive homeless assistance plan. The plan would contain an assessment of the size and characteristics of each jurisdiction's homeless population; a description of all available services for the homeless within a jurisdiction; a strategy for meeting job placement, training, education, health, housing, nutrition, and income maintenance needs of the homeless in each jurisdiction; and an explanation of how Federal assistance will be used to meet these needs. The Interagency Council on the Homeless established by S. 809 would review and approve these plans, as well as carry out performance evaluations of the administration of State and local homeless programs.

We strongly object to this provision. It would frustrate the bill's intent of distributing assistance for the homeless as rapidly and as simply as possible. States and localities would have to go through an arduous and lengthy paper exercise to meet the plan's requirements. For example, the bill calls for an inventory of "all available services for the homeless population" within the jurisdiction. We know of no locality that has this information, or that could obtain it without massive effort. Since States are, of course, larger, this requirement would have even more serious effects on them. In addition, the Interagency Council would have to go through a lengthy start-up period, in which it organized, selected its staff, promulgated whatever regulatory or other administrative guidance would be needed, and opened for business.

It is clear that these aspects of section 1 would substantially delay assistance for the homeless, quite possibly into the middle of fiscal year 1988. This delay, and the paper burden associated with it, seem to be totally unnecessary, because at the end of the submission process, the review that section 1(c) comptemplates appears to be a simple "rubber stamp" of the information submitted in the plans.

Moreover, the bill would inject the Interagency Council as a "Co-Administrator" of the Emergency Shelter Grants program with HUD. The Council would review and approve grantees' comprehensive homeless assistance plans. The comprehensive plans would replace the Homeless Assistance Plans that HUD now reviews under the Shelter Grants program as a prerequisite to funding. This new system seems to contemplate the Council approving grants that HUD is responsible for administering—a bifurcation that is both confusing and potentially troublesome. In addition, the comprehensive plans merely hint at the types of activities the grantee intends to undertake, and are subject to the most cursory review by the Council, thus providing HUD with little guidance on how to conduct its performance review functions. The Homeless Assistance Plan now approved by HUD is a far more valuable document from HUD's perspective, since it indicates the grantee's proposed use of funds and can be used to monitor grantee performance.

Finally, as a technical matter, section 1(a) provides that any State or locality that has a grant allocation in excess of the grant threshold must comply with the comprehensive plan requirements. Since the Shelter Grants program imposes a grant minimum only on units of government and not States, the bill would lead to the anomaly of funding States with allocations below the locality threshold without any submission requirements.

3. Section 8 Certificates. Section 4(a) of the bill authorizes additional Section 8 Certificates for use solely for homeless individuals and families. The Department believes that if any additional Section 8 assistance is to be provided, it should be through the Housing Voucher program, not the Certificate program. Vouchers provide greater housing choice than Certificates for very low-income families. This would give families a greater opportunity to move into traditional housing in traditional neighborhoods—a factor that may be of crucial significance in efforts to help homeless families make the transition to independent living.

In addition, we believe that it is inappropriate to earmark Section 8 assistance for the homeless. The homeless who meet Section 8's income requirements are now eligible for rental assistance. The bill's "set-aside" requires PHAs to establish separate waiting lists and to separately account for each of the Certificates provided under this bill for their full five-year term. These requirements are wholly unnecessary, given the current eligibility of the homeless for Section 8 assistance.

Section 4(a)(3) requires funding amendments to be for five years. HUD opposes the use of any amendments for the Section 8 Existing program, and considers the bill's five-year term to be unduly costly and unnecessary.

Finally, section 4(a)(4) provides that a Certificate may be "attached to the structure" if the owner is a nonprofit organization that has agreed to furnish decent housing and a level of support services satisfactory to the public housing agency. The Department strongly objects to this feature of the bill. The Department's clear policy is to promote housing choice and portability of assistance, and to assist people rather than structures.

4. Section 8 Moderate Rehabilitation. Section 4(b) authorizes the use of the Section 8 Moderate Rehabilitation program solely in connection with the rehabilitation of single room occupancy housing for use by homeless families. This provision perpetuates use of project-based subsidies, which, as noted above, is contrary to HUD's housing assistance policies. It provides 10-year amendment authority, and authorizes HUD to "renew" contracts for an additional 10 years. As noted above, HUD opposes amendments of any period for the Existing Housing program, let alone 10 years, and the 20-year total comtemplated by the bill is clearly excessive.

Finally, section 4(b)(4) provides for a limit on the total cost of each rehabilitated unit of $14,000, excluding certain fire and safety improvements, and for such higher amounts as HUD determines are reasonable and necessary to accommodate certain special local conditions. HUD opposes this provision. The $14,000 limit, and the higher amount permitted in certain circumstances, could make the program exceedingly costly and would divert scarce rental subsidies from other urgent needs, and homeless persons or families.

The Office of Management and Budget has advised that there is no objection to the presentation of this report from the standpoint of the Administration's program.

Sincerely yours,

/s/ J. Michael Dorsey

J. Michael Dorsey

QUESTIONS SUBMITTED BY SENATOR DOMENICI

URBAN DEVELOPMENT ACTION GRANTS

The Administration has proposed to terminate the Urban Development Action Grant Program and rely on Community Development Block Grants to support local development activities. Let me ask you to compare these two programs.

Question: What activities can a community undertake with UDAG that it cannot do with CDBG?

Answer: A community can undertake new construction for housing under UDAG but not CDBG. However, there is a pending Administration proposal to make new construction of housing eligible under CDBG. Also, CDBG, but not UDAG, is subject to more stringent tests for low-moderate income benefit, urgent needs, or elimination of slums and blight. It is possible that certain projects funded by UDAG would not meet those tests. CDBG provides communities with on-going financial support for basic community and economic development activities, while UDAG responds to generally large and one-time development opportunities while they are current.

Question: Isn't it true that the regulations governing UDAG define eligible activities by reference to the CDBG regulations?

Answer: Yes, UDAG assistance can be made available for any eligible activity specified in the CDBG regulations which supports economic recovery. The exceptions are that large cities cannot use UDAG assistance for planning or application development. Also, UDAG assistance is not available for public services or projects that intend to facilitate relocation of plants or facilities from one area to another, unless such relocation does not adversely affect the unemployment or economic base of the losing area.

Question: One of the arguments in favor of UDAG is that communities use these grants to leverage from other sources. To what extent is that also true for CDBG?

Answer: UDAG requires a minimum leveraging ratio of 2.5:1 between private investment and UDAG funds. The current UDAG leveraging ratio exceeds 6:1. CDBG encourages leveraging and it occurs in many cases, but it is not a requirement.

Question: Are there other similarities between the two programs that Congress should be aware of when considering the Administration's request?

Answer: Eligible activities are similar as noted, except for new construction for housing programs. The CDBG entitlement program provides about 13 percent of its funds for economic development activities and the State CDBG program provides about 25 percent of its funds for economic development activities.

Question: How do administrative costs for the two programs compare, adjusting for program size?

Answer: The following table indicates the obligations incurred for HUD to administer the CDBG and UDAG programs during fiscal year 1986.

	Staff-Years	Obligations
CDBG		
Salaries and Benefits:		
Headquarters................	49.3	$2,490,000
Field.......................	487.4	19,321,000
Subtotal..................	536.7	21,811,000
Support Costs a/.............	NA	3,003,000
Total, CDBG............	536.7	24,814,000
UDAG		
Salaries and Benefits:		
Headquarters................	54.7	2,762,000
Field.......................	149.7	5,934,000
Subtotal..................	204.4	8,696,000
Support Costs a/.............	N/A	1,144,000
Total, UDAG............	204.4	9,840,000

HUD administrative costs represent 2.2 percent of 1986 UDAG announcements ($442 million) and .9 percent of 1986 CDBG obligations ($2,793 million).

Local administrative costs for the CDBG program average about 12.5 percent of the grant amount for entitlement communities, and approximately 8 percent of the grant amount for the small cities program. The latter figure represents the combined costs for both the States and their small city recipients. For the UDAG program, current program policy does not allow large cities to use their grant funds for administrative costs whereas small cities are limited to 3 percent of the grant amount.

a/ Includes travel, transportation, equipment rental and procurement, communications, printing, automated data processing, supplies, data and statistical services, and other miscellaneous support.

ASSISTED HOUSING RECAPTURES AND CARRYOVER

Question: What is your best estimate of the amount of carryover and recaptures that will be available in the assisted housing account for FY 1988?

Answer: The 1988 Budget assumes that all authority available in 1987 will be reserved and therefore no authority will be carried forward into 1988. The current estimate of recaptures for Housing ($204.7 million) has not changed from that in the 1988 Budget. The estimate for recaptures under the Public and Indian Housing programs has been revised to $161.6 million--$143.1 million from development programs and $18.5 million from modernization. This would bring the total estimated recapture up to $366.3 million of budget authority.

Question: How much is this number likely to change between now and the time Congress begins work on the HUD appropriation bill?

Answer: The estimate of carryover is not expected to change before the time that Congress works on the Appropriation Bill. The Department currently anticipates obligating all of the authority made available in 1987, although there is almost always some small amount left over. The revised estimate of recaptures is also not expected to change from the $366.3 million reestimate prior to work on the Appropriation Bill.

BIENNIAL BUDGET CYCLE

Question: Calls for budget reform are increasingly heard as budget deadlines are too often missed, important budget decisions are delayed, appropriation bills and other direct spending legislation are held up in committee, and omnibus spending bills take the place of timely and orderly consideration of individual bills. One procedural reform that is being considered is the two-year budget cycle where budget and appropriations matters would be considered in the first year, and authorizations and oversight would be undertaken in the second year. Would your department/agency favor a biennial budget process? What benefits would your agency achieve in a two-year appropriation cycle?

Answer: The Administration has generally supported Congressional consideration of a biennial process, and we agree with that position. A 2-year cycle might simplify some of our planning processes, although we would still have to adjust estimates in the housing programs at least annually.

Question: Approximately what proportion of your annual appropriation request would you consider simply repetitious of the previous year's submission?

Answer: For the Department's programs, while most of the policy directions stay constant, virtually none of the numbers remain the same from year to year. For the most part, our programs respond to changing conditions in the economy, changing demands for services, changes in the mix of services, and changes in funding availability. Each year, we reestimate these things, and provide new justifications, with information on changes from prior plans and estimates.

Question: What difficulties can you foresee in preparing and submitting a two-year budget to the Congress?

Answer: For economically sensitive, and demand-driven, programs like ours, the difficulty is simply that the accuracy of estimates declines with time. An estimate for activity 2 years in advance is less accurate than a near-term estimate. Practically, this could mean additional requests for supplemental appropriations, rescission proposals, and reprogramming requests.

Question: Would you expect to realize any budget savings if you could plan your agency budget on a two-year basis? If so, could you estimate how much?

Answer: There could be some savings in staff time provided there would also be a decrease in Congressional hearings and budget paperwork. If a complete budget had to be developed each year, however, even if the appropriation requests did not change, such savings would disappear. There also have been recommendations that the Congress substitute intensive oversight hearings for appropriations hearings. In that event, the savings could be negative.

Question: If you oppose the biennial budget concept, please give this subcommittee your reasons why.

Answer: As noted earlier, we are not opposed to the concept.

QUESTIONS SUBMITTED BY SENATOR HATFIELD

CDBG ENTITLEMENT GRANDFATHERING

Question: It is the Committee's understanding that Multnomah County, Oregon, was eligible to receive CDBG entitlement funding beginning in 1984, after having reached the necessary population requirements to be designated as an Urban County. In October 1986, 25 jurisdictions were grandfathered into the Urban County/Metropolitan City program even though their populations had dropped below regular eligibility requirements. Multnomah County, Oregon, however, was omitted from the list because of its original participation date. In essence, those jurisdictions, which had been in the program since 1983, were grandfathered and continue to be eligible for CDBG funding, but Multnomah County was not considered because they did not begin participating until 1984.

Is it the Department's understanding that these facts are generally accurate? If not please explain.

Answer: These facts are correct with the following clarification. Multnomah County, Oregon, first met the statutory requirements to qualify as an urban county in fiscal year 1984 under a special "rapidly growing county" provision which used population and other criteria. In fiscal year 1987 there are 25 metropolitan cities that are grandfathered. Each of these 25 cities would have otherwise lost its funding either because of a population loss (8 cities) or because of the loss of designation as a central city of a metropolitan statistical area (17 cities). All 25 cities were entitled in fiscal year 1983. Multnomah County, Oregon, is not entitled in fiscal year 1987 because it no longer meets population requirements and was first entitled in fiscal year 1984, whereas the current grandfathering language specifies fiscal year 1983.

Question: Is Multnomah County, Oregon, the only jurisdiction affected by the 1983 cutoff, or are other jurisdictions now ineligible because their participation began in 1984, 1985, or 1986? If so, please list them.

Answer: For fiscal year 1987, Multnomah County, Oregon, is the only jurisdiction not funded because of the 1983 cutoff. For fiscal year 1988 new population data and changes to central city designation, that would be used in fiscal year 1988 or future years, could potentially affect other places first entitled after 1983. We would not be able to identify any such places until the population data is updated and central city designations are made after July 1, 1987.

Question: To the best of your knowledge, why was the 1983 date selected? Was it known at that time that some jurisdictions were omitted from the list and would be ineligible as a result?

Answer: To the best of our knowledge, the 1983 date was originally selected for inclusion in the reauthorization bill covering fiscal years 1984, 1985, and 1986. It was the year immediately preceeding the year of the bill, so no places could be excluded that were eligible at that time. When the grandfathering language was about to expire, an extender was used to keep their status in place. Subsequently, various other extenders continued their eleigibility, but no change has been made to the requirement of program eligibility in 1983.

Question: With regard to Multnomah County, Oregon, what has been its annual historic CDBG funding level since the program began and what level of funds would have been provided in FY 1987 had they been grandfathered like the other 25 jurisdictions?

Answer: Multnomah County, Oregon, was allocated $1,846,000 in fiscal year 1984, $1,836,000 in fiscal year 1985, and $1,544,000 in fiscal year 1986. If they had been entitled in fiscal year 1987, the amount would have been about the same as they received in fiscal year 1986. Because Multnomah County was in the nonentitlement part of Oregon, the State amount increased about $1 million over the level the State allocation otherwise would have been in fiscal year 1987.

SUBCOMMITTEE RECESS

Senator PROXMIRE. We will convene tomorrow, and I am going to recess the committee as of now. We will stand in recess until tomorrow, April 2, at 10. We will reconvene in this room.

Mr. Secretary, you will once again be the principal witness. We will continue to take testimony from the Department of Housing and Urban Development. Thank you.

[Whereupon, at 11:55 a.m. Wednesday, April 1, the subcommittee was recessed to reconvene at 10 a.m. Thursday, April 2.]

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT-INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1988

THURSDAY, APRIL 2, 1987

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10:15 a.m. in room SD–124, Hon. William Proxmire (chairman) presiding.

Present: Senators Proxmire, Lautenberg, and Grassley.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

STATEMENT OF HON. SAMUEL R. PIERCE, JR., SECRETARY

ACCOMPANIED BY:
- ALBERT J. KLIMAN, DEPARTMENTAL BUDGET OFFICER
- J. MICHAEL DORSEY, GENERAL COUNSEL
- THOMAS T. DEMERY, ASSISTANT SECRETARY FOR HOUSING, FEDERAL HOUSING COMMISSIONER
- JAMES BAUGH, GENERAL DEPUTY ASSISTANT SECRETARY FOR PUBLIC AND INDIAN HOUSING
- JACK STOKVIS, GENERAL DEPUTY ASSISTANT SECRETARY FOR COMMUNITY PLANNING AND DEVELOPMENT
- JUNE KOCH, ASSISTANT SECRETARY FOR POLICY DEVELOPMENT AND RESEARCH
- JUDITH L. HOFMANN, ASSISTANT SECRETARY FOR ADMINISTRATION

OPENING REMARKS

Senator PROXMIRE. Mr. Secretary, I apologize for being late. I tried to go to the floor to make a statement, but as you know, the floor is all tied up and was not able to do even that.

Today we will hear once more from the Department of Housing and Urban Development. Our principal witness is Secretary Pierce.

Mr. Secretary, it is good to have you with us again today.

Mr. PIERCE. Thank you.

Senator PROXMIRE. I plan to revisit some of the issues we discussed yesterday and then move on to other topics. However, before we begin the questioning, I would like to give you an opportunity to elaborate or clarify any comments that were made in the course of yesterday's hearings.

Do you or your staff have anything you would like to say at this point?

PROGRAMS FOR THE HOMELESS

Mr. PIERCE. What I would like to do, Mr. Chairman, is to put a brief statement on the record of the HUD programs that we have for the homeless. That can be done with just a simple one-page statement and I could just put it in the record, if you will allow me to, to save a lot of time.

Senator PROXMIRE. Fine, we are happy to do that.

[The information follows:]

HUD PROGRAMS FOR THE HOMELESS

Temporary shelter facilities are a response to the immediate needs of the homeless. HUD programs which state and local governments can use to fund temporary shelter activities include:

- —Community Development Grant Program—Cities have used over $100 million of CDBG funds for homeless since 1983.
- —Emergency Shelter Grant Program—Enacted October 1986; $10 million appropriation allocated to eligible cities and states in mid-December 1986.
- —HUD also makes single-family houses available for use as shelters.

Permanent housing is a longer term need of the homeless.

- —In public housing, homeless families and elderly homeless have a priority for emergency admission to housing at many PHA's.
- —Section 8 certificates and vouchers. Rental assistance can also be provided on an emergency basis to the homeless. Several PHA's have established successful programs linking social service programs and section 8 certificates to help homeless families become reestablished in the community.

Special housing facilities are needed for the homeless.

- —In the program for the chronically mentally ill, HUD is sponsoring, with the Robert Wood Johnson Foundation, a national demonstration to provide housing and services to the chronically mentally ill, many of whom are homeless.
- —HUD is providing 1,125 section 8 certificates, with a budget authority of $77 million, for this program.
- —In the Transitional Housing Demonstration Program, enacted in October 1986 and funded at $5 million, HUD will fund both housing and social services needed by special groups among the homeless, such as recovering alcoholics or victims of domestic abuse.

MODERNIZATION NEEDS STUDY

Senator PROXMIRE. Could Dr. Koch come forward?

Dr. Koch, yesterday you said that Abt's national estimate of modernization needs was $21 billion, whereas yours is $10.7 billion.

Dr. KOCH. I am sorry, Mr. Chairman; that is not what I meant to imply. I said that Abt's was indeed $21.5 billion, and $10.7 billion is a part of that. We have broken that down, as the study broke it down, into various categories. As you go through those categories in the report, what you find——

Senator PROXMIRE. Wait a minute. Let me stop right there, at the $10.7 billion. I understood you to say that the modernization, in your view, would be $10.7 billion, not $21 billion. You say that that was not what you meant to convey?

Dr. KOCH. I did not mean to convey that we have as yet, within the Department, a view of what is acceptable and not acceptable in the report. That is what we will be reviewing in the next month, together with the Research Advisory Group. But for purposes of analysis, we have broken the estimate down into various categories, as indeed the report broke it down.

The report has the following categories: What is known as FIX, which includes repairs and replacements, and the category of ADD, which was put into the study by the Research Advisory Group. ADD's are further divided into the category of ADD necessary to bring the stock up to modernization codes, or local property codes, and other ADD's.

ESTIMATE OF FIX ITEMS

Senator PROXMIRE. Let me just interrupt once again. I apologize, Dr. Koch, but I am afraid that if you go ahead I am not going to have any questions to ask because you are going to answer them all. I want to have some role in this.

Let me just proceed to say, as I understand it, Abt's estimate for the costs of repairing or replacing existing architectural, mechanical and electrical systems—the so-called FIX items that you referred to—is $9.5 billion, and I want to know what work, if any, does your estimate of $10.7 billion include, other than FIX items.

Dr. KOCH. It includes the ADD's items necessary to bring the stock up to code. It adds administrative fees. It takes out what is in the pipeline from modernization funds allocated but not spent when the inspections were done. It also looks at units that are scheduled for demolition. It nets out the costs of modernizing those units. It adds the cost of handicap accessibility, lead-base paint removal, and also adds modernization costs for the Turn-Key III Program, Guam, and remote areas of Alaska, which were not included in the study.

Senator PROXMIRE. If I understood you correctly yesterday, you suggested that the ADD's cost identified in the Abt study is the cost of additions and upgrades to meet specific standards, or to enhance long-term viability, were not a basic part of public housing modernization.

Don't the ADD's costs include such essential elements of decent and safe shelter as adding fire escapes, adding secure locks, and upgrading bathrooms with showers?

Dr. KOCH. You are absolutely right, but I did not mean to imply that yesterday. The FIX plus mandatory ADD's category already includes ADD's that are required to bring the buildings up to either modernization standards, or local code standards. The examples you cite are included in the number we accept under FIX plus mandatory ADD's.

Senator PROXMIRE. You said either. Is it either or both?

Dr. KOCH. Both.

COSTS PROPOSED BEYOND MODERNIZATION STANDARDS

Senator PROXMIRE. Are not the major elements of the ADDS costs items of work agreed to by both the PHA's and the Abt property inspector?

Dr. KOCH. Yes.

Senator PROXMIRE. Give me examples of modernization work that the Abt property inspector says is appropriate, but which you think is not in accord with HUD modernization standards.

Dr. KOCH. I would not say that I think they are not in accord with the standards but that they are required by the standards. These are categories that are defined somewhat differently.

In the ADD's category, there are those required ADD's we have just discussed. There is accepted under the modernization code a category of additions and upgrades that is project-specific.

Note that the way the ADD's were reviewed and computed is that the PHA directors, working together with Abt and the Department, put together this huge list of possible improvements and upgrades under the ADD's category. PHA directors then determined what they needed and inspectors, when they were making their FIX inspections, reviewed the ADD's and gave what was called an inspector's second opinion. So we have under the ADD's not just those that are now included with FIX, but also a category that is not necessary for either modernization or local code standards.

Within that category, there is an area that is fundable under our modernization guidelines, as project-specific improvements and upgrades. So, for example, in a high-crime area, a project director might have requested hardware for security. The inspector would review it and say in this area, this seems sensible and give a second opinion that this is an ADD which has some justification.

If the same hardware were requested in an area where there is no crime, no really high crime rate, the inspector might have said this was an unnecessary ADD. Those are the categories that, in addition to ADD's we have combined with the FIX estimates, have a breakdown by Abt. That is, ADD's for which the inspectors saw some justification, came to $3.7 billion; ADD's for which an inspector did not give his approval came to $4.1 billion—closer to $4.5 billion when you add administrative costs.

Senator PROXMIRE. I am not sure I have the answer to my next question—I think you may have just given it at the end. What cost does Abt assign to the ADD's categories which its inspectors and PHA's agree are necessary?

Dr. KOCH. $3.7 billion.

Senator PROXMIRE. Fine. Now yesterday, reference was made to the Research Advisory Group, made up of representatives from housing authorities. Did not HUD and Abt agree with the Research Advisory Group [RAG] that the ADD's categories would not be considered any more or less integral to modernization of public housing than the FIX categories?

Dr. KOCH. I am not sure what "more or less integral to" means. It was determined that ADD's would be broken down into the categories I have just relayed to you, and that is the way they are presented in the study.

Absolutely integral to requirements for reaching codes, either our mod code or local code, or wanted for project-specific reasons, or unnecessary from the corroborative stance of the inspector.

REDESIGN COSTS

Senator PROXMIRE. Dr. Koch, I believe you told us yesterday that you did not include $2 billion for redesign costs in your estimates of modernization needs.

Does not the redesign part of the Abt study include restoring vacant projects by combining units into more manageable rentable sizes or improving security through reducing entryways, and is not the redesign and reoccupancy of obsolete buildings an integral part of modernizing public housing?

Dr. KOCH. Again, if that is the impression I left, it is not the impression I meant to leave. I was simply breaking down the categories. The redesign was agreed upon as something that the RAG wanted to be reviewed, and we came up with a method of reviewing it at 75 housing projects, and it is estimated in the report that we have at $2 billion.

I wish to convey that in reviewing all of this material, all we have focused on in this past week are the numbers in which we found some errors and have had them corrected by Abt.

We have not yet begun, as a Department, to look at what these categories mean and to make determinations on necessary/not necessary. We will not do that until we have met with the RAG and get all input. We have also to work with HUD's Office of Public and Indian Housing, which just also got the report.

NEED FOR ACCRUAL STUDY

Senator PROXMIRE. Apparently Abt is not now able to deliver the accrual study, documentation of the data and the analysis report. Those sound like vital parts of the $4.5 million modernization study.

Can you briefly describe each, its significance to this study and what needs to be done to get these items from Abt?

Dr. KOCH. The significance of the accrual study is that this will give us a sense of the long-term replacement capital needs for the major systems in public housing, and we consider it absolutely essential. We are now in discussions with Abt—we being PD&R, our contracts office, HUD's general counsel, to determine what data is available and what options we have for getting the accrual study.

Senator PROXMIRE. I want to know the significance of these parts of the study—the accrual study, the documentation of data, the analysis report.

Dr. KOCH. The significance is, it will give us a sense, in addition to meeting backlog needs—what you have now, what we have looked at in the numbers that are provided is what needs to be fixed, repaired, replaced, added, that are needs that have developed until now. The accrual needs are the needs that are ongoing in maintaining the major systems in housing.

So it is an additional number, in addition to bringing the stock up to standard.

Senator PROXMIRE. You consider that information vital, don't you?

Dr. KOCH. Yes.

Senator PROXMIRE. What plans do you have to get it?

Dr. KOCH. The plans currently are under discussion with Abt. We are trying to find out. Abt has said to us they cannot complete the work; they had an overrun. They have not yet identified the size of the overrun. We are trying to find out from them what indeed they have done thus far, on accrual, what needs to be done to get this work through them, or through another contractor working together with PD&R inhouse capacity. We have to know that very soon.

Senator PROXMIRE. Do you plan to fund the accrual part of it? You say they have an overrun—if that is necessary?

Dr. KOCH. I don't know, Mr. Chairman. It depends on the size of the overrun and what they actually have done, and whether it would be more efficient to go through them or through someone else.

Senator PROXMIRE. But you will get the accrual information.

Dr. KOCH. We absolutely will get the accrual information.

ABT VOUCHER STUDY

Senator PROXMIRE. Yesterday, you touched on the Abt voucher study. I understand that they have submitted a preliminary report on that subject. Is that the case, and if so, what conclusions did the preliminary study reach?

Dr. KOCH. We have an interim report which is now being revised and will be finalized by May, which we can send to you. But what we have from the report—and remember that this is from the 20 sites that we are studying, is the following: One finding deals with the success rates of vouchers and certificates. For both categories we learned that 6 out of 10 people who are getting the vouchers or certificates are finding housing. So it is a 60-percent success rate, somewhat higher than the 50 percent that we knew about as we studied certificates at an earlier time and as we studied a voucher-like program under the Experimental Housing Allowance Program [EHAP].

COMPARISON OF RENT BURDEN

We also know that on average, the rent burden for voucher holders is a little higher than for certificate holders.

Senator PROXMIRE. How much higher?

Dr. KOCH. 0.32 percent of income for certificate holders and 34 percent of income for voucher holders. You asked yesterday what is the percent of people paying what range of income. I would like to state that.

We have 19 percent paying less than 20 percent of income; 22 percent are paying between 20 percent and 30 percent of income; 11 percent are paying very close to 30 percent; 22 percent are paying between 30 and 40 percent; 14 percent are paying between 40 and 50 percent; and 12 percent are paying above 50 percent of income.

Senator PROXMIRE. Those are very interesting statistics. I have not seen those before. You have an accumulation of 50 percent who will pay more than 30 percent?

Dr. KOCH. Yes; that is right.

COMPARISON OF COSTS

Senator PROXMIRE. Do you have any figures on the cost to the taxpayer of the two programs?

Dr. KOCH. We have figures on average subsidy costs which indicate that the voucher subsidy costs are somewhat higher—$299 average subsidy costs; for the certificate, $276.

Senator PROXMIRE. A $23 difference. The voucher cost is higher, you say?

Dr. KOCH. Yes; we also have some material on those who rent in place, and movers, in relation to hikes in the rent. The rent for those who rent in place is 17 percent higher than the preprogram rent for voucher holders and 15 percent higher for certificate holders.

For movers, for vouchers, the rent is 38 percent higher than they were paying in their previous unit and for certificate holders, 35 percent.

Of course, for both movers and families renting in place, the rent burden went down because of receiving the subsidy.

DELINQUENT DEBT WRITEOFFS

Senator PROXMIRE. Thank you very much, Dr. Koch.

Mr. Kliman, yesterday, you said you would try to come up with the amount of delinquent debt that had been written off between September 30, 1985, and September 30, 1986. Can you give us that figure today?

Mr. KLIMAN. Mrs. Hoffman can give you that figure.

Mrs. HOFFMAN. Mr. Chairman, the official records show $228.3 million written off as of September 30, 1986. This includes, however, about $112 million of losses on tanden plan sales which were erroneously classified as writeoffs.

Senator PROXMIRE. Thank you.

INDIAN HOUSING AS A SEPARATE ENTITY

Secretary Pierce, a number of Indian organizations have been in touch with my office to urge that the Indian Housing Program be separated from the Public Housing Program and treated as a distinct entity. What is your reaction to that suggestion?

Mr. PIERCE. My reaction is that I have been in favor of that. I think that it would be a good idea to keep the two separate in the sense that we would deal with them separately. They would still be in the Department, in the same general office, but we would deal with the two subjects separately.

Senator PROXMIRE. What steps are you taking to implement that?

Mr. PIERCE. My general counsel has worked with OMB on it and they have put something in the current budget proposal, but I don't think it is going to be satisfactory as far as the Indian tribes are concerned.

Senator PROXMIRE. These Indian groups say that 92,000 families are in need of housing according to the latest survey by the Bureau of Indian Affairs. However, your 1988 budget is proposing the construction of only 1,000 new Indian housing units. How do you plan to meet the needs of the remaining Indian families that will be left out?

Mr. PIERCE. Actually, we do not agree with their general conclusion.

Senator PROXMIRE. This is the Bureau of Indian Affairs; it is their conclusion.

Mr. PIERCE. Again, we can't agree with it. We do believe that we have a number in the pipeline—can you give me that exact number?

Senator PROXMIRE. While this gentleman is coming up, I want to make sure, Mr. Secretary, where your disagreement is. Do you disagree that there are 92,000 families that need housing?

Mr. PIERCE. Yes; I would disagree with their overall number. I think it is on the high side.

Senator PROXMIRE. Do you have an estimate?

Mr. PIERCE. I would think it would be quite a bit lower than that.

Senator PROXMIRE. How much lower? Half that?

Mr. PIERCE. About half that. Maybe a little more than half that.

Senator PROXMIRE. In other words, around 40,000 or so?

Mr. PIERCE. Something like that; yes.

Senator PROXMIRE. All right, sir, go ahead.

PIPELINE OF INDIAN HOUSING UNITS

Mr. BAUGH. Mr. Chairman, at the end of fiscal year 1986, there were 10,246 units of Indian housing in the pipeline. Of these, 6,139 units were not yet under construction and 4,107 units were started but not completed.

In looking at trends over the last 3 years or so, the Indian housing authorities have been able to expedite and move units in their pipelines so that they have averaged nearly 3,000 completions per year.

COMMUNITY PLANNING AND DEVELOPMENT PROGRAMS

Senator PROXMIRE. Mr. Secretary, you are requesting a total of about $2.5 billion for community planning and development in fiscal year 1988 with almost all the funds to be devoted to the community development grants. Under your proposed budget, the Urban Development Action Grant Program would be terminated and the Community Development Grant Program would be cut by $490 million.

Your 1988 request includes $47 million for the Secretary's discretionary fund, with $10 million of the total being used for technical assistance.

TECHNICAL ASSISTANCE PROGRAMS

Your inspector general, in his September report to the Congress, was critical of the extent to which technical assistance dollars were being used for indirect and administrative costs.

He indicated that 68 percent of the $19 million obligated for such projects was being used in that way. He also said that the $6 million of direct assistance was of questionable effectiveness because of problems in project planning, development, and evaluation.

Apparently, the community planning and development staff disagreed. My question is, have you taken steps to improve the efficiency and effectiveness of the programs, as recommended by your inspector general?

Mr. PIERCE. Yes; my staff has gotten together with the inspector general and we are working on ways to improve the programs. I think that we have reached general agreement with the inspector general as to how this should be done, and let me just get the last check on this—we have been working on it, and we have agreed, have we not, as to how it should be changed—and we are generally in agreement?

Mr. STOKVIS. Yes, Mr. Chairman. My name is Jack Stokvis, the General Deputy Assistant Secretary for CPD. We have made dramatic progress since the IG's report of August 15, 1986, on the four broad issues that were raised. First, regarding the issue of processing and funding of the front-end costs that you referred to in your figures of $6 million, we have changed the program so that we no longer pay for such expensive front-end costs, and we have modified our own procedures.

Second, on the question of planning, we have also changed the way we are doing things, and I think we have much more agreement with the inspector general. Third, on the issue of the evaluation, we just sent a memo—actually, on four audit issues, on March 31, and I feel confident we will be able to work that issue out with the inspector general.

Fourth and finally, on the overall issue of competition, the IG's investigation of the Secretary's discretionary fund covered the years 1982–84. In 1985, the IG concurred with the CPD on a new HUD handbook 2210.17 and we have since been adhering to the handbook on the awarding of all grants. I think, as a result, we have made dramatic progress in the way we administer the Secretary's discretionary fund.

Senator PROXMIRE. Thank you, sir.

UDAG STATISTICS

Secretary Pierce, I am concerned about the reliability of the statistics presented in your justification indicating the extent to which private dollars are being leveraged with UDAG dollars.

Last year you indicated that 1,487 projects have been funded through February 6, 1986. This year's justifications indicate that 1,366 projects were funded through February 6, 1987.

In other words, over the past 12 months, you have managed to cancel 121 more grants than you awarded. Can you tell us why this happened?

Mr. PIERCE. There are probably a variety of details as to why each one has happened. There has been no general reason for it. Most of the time, the particular cities involved, or the companies involved, have just not been able to come through and follow through with the contract agreed upon.

Another point was made here that the money we recaptured has been used. So the money has not been lost.

Mr. VAN DER VOORT [chief clerk of the subcommittee]. Let me just say that on the surface it is highly unusual for any program to end up in a net deficit situation in a 12-month period. In other words, in this case, you, in essence, deobligated more money than you obligated; deobligated more projects than you obligated, according to your justifications. I am just curious as to why that would have happened over the last 12 months.

Mr. PIERCE. Unless my people can go into any more details on an individual basis, it has just turned out that way.

Ms. DEAN. Those numbers are wrong.

Senator PROXMIRE. Would you come forward?

Mr. PIERCE. Deborah Dean, my Executive Assistant.

Senator PROXMIRE. I quoted from last year's justifications. Were they wrong as they were given to us?

Ms. DEAN. We will have to take a look at those numbers, because they couldn't be right. We have recaptured probably 25 projects this year, and we have funded probably 150. We will get you those numbers by this afternoon.

Senator PROXMIRE. A number of projects were given to us last year by HUD—1,487, and this year the number given to us by your agency was 1,336. The amounts were 17,412 private and 18,856 private for 1987—this year.

We relied on you for those figures. Now you are telling us——

Ms. DEAN. You are saying 1,487 applications?

Mr. VAN DER VOORT. The heading is private investment in UDAG funds cumulative, from beginning of program to February 6, 1986, 1,487 projects. The same table in this year's justification, private investment in UDAG funds, cumulative from beginning of program through February 6, 1987, 1,366, a total of 120-some odd fewer projects than you had accounted for last year.

So we are somewhat curious as to what happened to all those projects.

Ms. DEAN. Those numbers are very interesting, and they are cumulative numbers. We have not recaptured more projects than we have funded. So there is something wrong with the way we have phrased this. Can we provide the answer for the record?

[The information follows:]

DISTRIBUTION OF UDAG FUNDS

The information in the 1988 congressional justification (p. D-5) inadvertently included those metro cities of under 50,000 population under the small cities column. The table below correctly delineates metro cities and small cities. The data presented in the 1987 congressional justification was correct.

PRIVATE INVESTMENT AND UDAG FUNDS CUMULATIVE FROM BEGINNING OF PROGRAM THROUGH FEBRUARY 6, 1987

[Dollars in millions]

	Metro cities and urban counties	Small cities	Total	Ratio
Number of projects	1,527	1,245	2,772	
Amount:				
Private	$18,813	$7,256	$26,069	
UDAG	$3,160	$1,082	$4,242	6.15

DISTRIBUTION OF UDAG FUNDS

Senator PROXMIRE. Let me ask you this, Mr. Secretary. In an article written by Donald Lambro that appeared in the Reader's Digest last July indicated that 20 big cities have scooped up nearly half of all UDAG dollars and that three of the biggest winners—Los Angeles, Minneapolis, and St. Paul—rank in the bottom eighth of UDAG's list of eligible cities. Is that a fair criticism?

Mr. PIERCE. I would have to check the statistics to make sure, but I will say that there are certain sections of the country that have benefited more than others from UDAG and that is because of the nature of the program. The act is written to favor the Northeast and the Midwest. So consequently, large cities in those areas would do better than say, a city like Los Angeles, or San Francisco, or many other cities I could name.

Senator PROXMIRE. It says that three of the biggest winners were Los Angeles, Minneapolis, and St. Paul, and they rank in the bottom eighth of UDAG's eligible cities, so that the ones that were on the bottom of the eligibility did better than the ones that were higher up.

Mr. PIERCE. That is interesting. But if they did, they had the kinds of programs that were very good—exceptional, I would say.

Senator PROXMIRE. That means that the funds were not targeted very effectively, right?

Mr. PIERCE. It is not a matter of targeting funds. The funds are awarded on a competitive basis, but with an advantage in this competition going to cities in the Northeast and Midwest.

Senator PROXMIRE. They are competitive, as I understand it, with certain guidelines that are supposed to provide that they would go, among other criteria, to places of greatest need, unemployment, and so forth.

Mr. PIERCE. Yes; they are really geared to favor the Northeast and the Midwest.

TARGETING OF UDAG GRANT

Senator PROXMIRE. The same article also claims that UDAG grants have tended to benefit wealthy developers and big businesses. It indicates that 88 percent of commercial UDAG's have gone for constructing motels, hotels, shopping centers, office buildings and restaurants. Specific reference is made to a $3.3 million grant to South Haven, Mich., to finance a yachting marina, a restaurant, 16 condominiums, and 200 dockominiums.

Why haven't you been more successful in targeting UDAG funds to areas of real need?

Mr. Pierce. We think we have, and I would like to know exactly when those were done. We have tried to be very careful about this.

It is true that we have supported hotels, but these hotels have gone into cities and into areas that they otherwise would not have gone into. They have brought more employment to these places, more business. They have helped local economies, and it is true that rich people have been involved as developers or contractors because they are the people who can build up and help the economies of these communities.

We have tried to be careful with where these awards have gone, and I think that if you carefully study this, you will find that we have been very careful. Not to say that we have done a perfect job; we haven't. We have made mistakes along the way, but we think we have done very well in targeting these UDAG's toward places that absolutely need them, and their economies have benefited from them.

UDAG'S "BUT-FOR" TEST

Senator Proxmire. A lot of people disagree with that. I know that you are not in favor of continuing UDAG—neither am I—but one of the arguments I have heard over the years is that the UDAG Program funds projects that would have been undertaken in any event. You indicated that these would not have been done without Federal money.

What steps has your staff taken in the UDAG approval process to insure that that is not the case, that UDAG's go where the Federal money makes the difference?

Mr. Pierce. Let me get someone from the staff to tell you exactly what they do.

Mr. Stokvis. Mr. Chairman, you are referring to our "but-for" test, which we look to as the acid test of whether a UDAG project should be funded or not. We have a set of rigorous procedures that we put every UDAG project through to not only see whether it should be funded, but also that the federal support for the project is the least amount necessary.

If you would like, I could submit the "but-for" test and procedures for the record.

Senator Proxmire. We would like to have that; give us whatever you can.

[The information follows:]

"BUT-FOR" CERTIFICATION

The UDAG statute in section 119(j)(1) of the HCD Act of 1974, as amended, provides that action grant funds cannot substitute for private or other public funds. To make sure that UDAG is necessary for a project, there must be statement(s) from the development entity(s) that the private development is contingent upon the UDAG. The applicant's "but-for" certification is provided as part of the application. HUD's project underwriting is geared to evaluate, through financial analysis, the "but-for" certification.

The Department has provided, for the record, excerpts from the UDAG policy book which pertains to the "but-for" certification.

Excerpts From UDAG Policy Book

"But-For" Certification

Policy: No project is awarded UDAG funding unless the participants can affirm that "but for the UDAG, the project would not be implemented," and the project's underwriting clearly demonstrates that without UDAG funds the project is economically infeasible.

Explanation: The UDAG statute provides that Action Grant funds cannot substitute for private or other public funds. To make sure that UDAG is necessary for a project, there must be statement(s) from the development entity(s) that the private development is contingent upon the UDAG. The applicant's "but-for" certification is provided in the Assurances section that is part of the application. HUD's project underwriting is geared to evaluate, through financial analysis, the "but-for" certification.

Locational But-For

When a developer requests UDAG funds in order to locate or expand in a distressed city rather than another locality, the developer must demonstrate that but for the UDAG funds it is ecconomically infeasible for the project to be located in the distressed city. In order to make such a demonstration the developer must provide:

1. Comparative costs of doing the project in both locations.
2. Other benefits offered by one location over the other, such as tax differentials, labor costs, freight, etc.
3. Evidence that both locations are being seriously considered. Such evidence may include, for example: an option on land, documentation of ongoing negotiations with both localities, market and feasibility studies, and corporate resolutions.
4. Potential for financing in both localities, including types of financing.

But-For: Return on Investment

Policy: Action Grants are not intended to provide assistance so that profits are higher than industry standards.

A. **Real Estate Projects** (Office Buildings, Shopping Centers, Hotels, Industrial Buildings, Rental Housing)

The Developer's annual return on equity will be compared to standard real estate measures of profit which include (1) annual net cash flow as a percent of developer's equity ("Cash on cash" return), (2) tax benefits and (3) potential net proceeds from a sale or refinancing of the project.

The developer's annual return on equity will be negotiated in accordance with project risk and industry standards.

B. **Non-Real Estate Projects** (Developer is a manufacturing company that is developing its own facility).

Measures of profitability such as net income before taxes as a percentage of sales, return on equity and return on investment will be compared to industry standards. The standards will be based on information from experts and financial publications such as Annual Statement Studies by Robert Morris, other publications from Moody and Standard and Poors.

"BUT FOR" - HOUSING PROJECTS

Policy: The "but for" issue in housing is a question of the marketability of the units. The UDAG subsidy must be necessary to lower the cost of the housing to the point where there is enough market for the developer to be able to sell or rent the units, and they could not otherwise be marketed to any income group.

It is not an acceptable "but for" by itself that the UDAG subsidy will allow the units to be made available to lower income persons or families that could otherwise afford them without the subsidy.

In order to prove the "but for" in for sale housing projects, it is necessary that: (1) the construction lender's commitment be firmly in place, and (2) both construction lender and developer state and prove the market question by, among other things, identifying the income ranges that could afford the units, both with and without the UDAG subsidy, and that would choose to purchase them., e.g., there might be enough families in a given market to afford the particular units in questions, but because of location, style or other market reasons they would not choose to live in these units in this particular neighborhood, regardless of price.

"But For" Statement: Pocket of Poverty Applicants

Policy: In a limited number of cases in pocket of poverty communities, HUD will approve a project on a site directly adjacent to rather than within the pocket.

In this situation, the applicant must provide additional information to substantiate the "but for". Such information must include:

a. Documentation demonstrating that the project would not be economically feasible if located on a site in the pocket; and/or

b. Documentation demonstrating that the project's location on a site in the pocket would cause harm to the low- and moderate-income residents of the pocket and the area's overall physical and economic development.

BUT-FOR - IRB SPECIALS

1. Applicants for UDAG funds requesting to raise the capital expenditure limit from $10 million to $20 million must demonstrate that the project cannot proceed with conventional financing and requires IRB financing.

2. If the first requirement is met the development entity must demonstrate that either the project costs are above the $10 million limit, or that the development entity has had sufficient capital expenditures in the metropolitan area of the project for the past three years to necessitate the use of UDAG funds to be able to use tax exempt IRBs for the project.

(Revised 10/86)

DETERMINATION OF "BUT-FOR" WITH PREVIOUSLY SOLD INDUSTRIAL REVENUE BONDS

Where an Industrial Revenue Bond was sold (funded) prior to the preliminary award of an Action Grant, testing the "but for" must take a series of steps in order to determine whether this project is acceptable in accordance with Section119(j), the "But For" test. Note: This policy does not effect the current underwriting procedures for unsold Industrial Revenue Bonds.

I. If the bonds were sold and the funds are held in escrow subject to the preliminary award of an Action Grant then recipient must provide those bond documents (e.g. Trust Indenture, private offering memorandum, Letter of Credit, official statement, etc.) stating the requirement for an Action Grant. If this "but for" test is met by the bond documents, continue the UDAG underwriting as normal for substantiation of the "but for".

II. If the bonds were sold not subject to the preliminary award of an Action Grant, either as a public offering (e.g. sold by an investment bank) or through a private placement (e.g. purchased by a bank, insurance company, or other such institution), then:

1. The Recipient must provide written statements and documents from the following parties.

    a. From the developer/borrower, a written statement explaining why the project cannot go forward without a UDAG and committing: (i) to never drawdown the bond funds for the project without receipt of an Action Grant; (ii) to instruct the Issuer to request the trustee to redeem the bonds upon notification that UDAG funds have been denied; and (iii) to declare to bond counsel that the project is abandoned if UDAG funds are denied.

    b. From the issuer, a written statement confirming their understanding of the Developer's/borrower's position as expressed in "a" above, and committing to instruct the trustee to redeem the bonds upon notification from the Developer/borrower.

    c. From the bond counsel, a written statement opining: (i) that the bonds can be redeemed and when/how the redemption will occur if the UDAG is not received; and (ii) that the "new" project with UDAG funds will not be so different from the original project as to force a redemption of the bonds, or that the project difference can be remedied without a redemption by amending the bond documents to keep the original bond issue in place.

    d. From the Trustee, or other participating party, copies of all bond documents from the existing issue that will assist UDAG to understand the uses of bond funds, bond redemption provisions, and the general goals and circumstances of the project to have been financed by the bond issue now in place. The following bond documents should be provided, though individual bond issues may not have been offered using all the documents from this list: trust indenture, private offering memorandum, letter of credit, reimbursement agreement, mortgage/lease agreement, official statement/prospectus, and bond purchase agreement.

2. Development Officer should establish the project's "but for" via the following steps:

   a. Establish the project's capital expenditures (uses) and sources from the bond documents and statements received per step 1 above.

   b. If necessary, clarify or go behind the bond documents/statements through discussions with parties to the bond issue. For example:

   (i) if the bond issue is enhanced by a letter of credit, the bank that issued the letter of credit must furnish the underwriting criteria including the sources and uses of the funds required for the specific project;

   (ii) if the issue was a private placement and not enhanced by a letter of credit, ascertain from the purchaser the underwriting criteria, including the sources and uses for the project.

   c. Compare the project sources and uses for the bond issue that has been sold to the sources and uses of the project proposed in the UDAG application. If this comparison identifies a reasonable explanation for why UDAG funds, not required or contemplated in the initial bond offering, are now required for the project to be built (e.g. cost over-runs), then the "but for" can be established.

3. If the above steps establish the project's "but for", then the previously sold Industrial Revenue Bond proceeds should be counted in the private leverage ratio. Of course, these bond proceeds are subject to existing policies for calculating the exact amount of "countable private funds."

4. Any positive arbitrage income earned on the escrowed funds net of required debt service must be placed into the project as additional private equity. The infusion of such additional equity, as well as any necessary increase to the bond and/or equity commitments, must follow normal policy for funding commitments. This includes UDAG's deadline for receipt of financing commitments. All commitments must be executed and accepted by developer (if applicable) and forwarded to the Central Office no later than 6:00 p.m. on the 15th day (or its alternative if a weekend or Federal holiday) of the funding month. However, the documents required under II.1 of this policy are not defined as financing commitments and are not subject to the 15th day deadline.

Least Amount Necessary

The UDAG statute requires that the least amount necessary of UDAG funds be awarded to a project to enable it to be carried out.

The least amount necessary will be determined by ensuring that the maximum feasible amount of financial commitments other than UDAG are committed to a project, the costs of the project are accurate and reasonable, and that developer and corporate profits are reasonable.

ACCUSATIONS OF PIRATING IN UDAG

Recently, there has been a substantial amount of controversy over UDAG funds being used to pay for industry to relocate in low labor cost areas. One example of this is the relocation of the American Hoist & Derrick Co. from St. Paul, Minn., to Wilmington, N.C.

There are safeguards in the Housing Community Development Act to prevent this pirating of industry. However, the safeguards currently in place do not appear to have been transformed into working policy in the Department.

What steps are you taking to avoid a repetition of the St. Paul-Wilmington situation? We had a similar situation with respect to Racine and a city in Iowa. Of course, it is always very distressing, not only to the Members of Congress involved in the area that loses the business, but it also terribly distressing for the people who are in high unemployment areas to begin with, when they have taken from them a business which is very important to their employment.

Mr. PIERCE. Actually, in the case you mentioned that went to Wilmington from Minnesota, we had an understanding that the only thing that would be manufactured in Wilmington was a new type of crane material that could not be manufactured in the plant in Minnesota. That was the basis on which it was done.

It was not in competition with the Minnesota plant. The Minnesota plant could not manufacture this material. Is that right?

Mr. STOKVIS. That is correct. The resolution on that—we are now discussing, and general counsel can clarify, with the Justice Department regarding the final resolution of the *Am Hoist* case.

There is no resolution yet, but we are discussing with Justice on a legal settlement of that case.

Senator PROXMIRE. Why is Justice involved in this matter?

Mr. PIERCE. Because there has been litigation. We have fought about this.

USE OF UDAG FUNDS FOR LOANS

Senator PROXMIRE. Mr. Secretary, your justifications make it clear that UDAG grants may be used by cities for subordinated loans directly to firms to augment private investment. When the loans are repaid, the money can then be recycled for further economic development.

What proportion of your UDAG grants are currently being used by cities for this kind of loan activity?

Mr. PIERCE. I don't have the exact percentage, but it is the bulk of the UDAG loans on various terms to the city, and as you know, the program now is, I think, 9 years old, and a lot of that money is going back to the cities.

In fact, some cities are getting more than half of the average UDAG they received in repaid loans from previous UDAG's, which they in turn recycle.

Senator PROXMIRE. Can you give us any idea of what proportion of the UDAG activity financed by the federal government is involved in these loans? Is it one-half, 25 percent, 10 percent, 90 percent; some rough notion? Can you give an estimate of that? I have heard some people make the claim that most of this are loans that have been recycled and there are others who challenge that and say that that is not the case.

Mr. STOKVIS. Most of the UDAG's are loans to the city.

Senator PROXMIRE. All UDAG's?

Mr. STOKVIS. Most of the UDAG's. Until 1979, most of the UDAG's were outright grants.

Senator PROXMIRE. Is that 51 percent, 60 percent?

Mr. STOKVIS. I can get you the exact percentage.

[The information follows:]

PERCENTAGE OF UDAG FUNDING AS LANS

An estimated 83 percent of 1978 grant funds were outright grants. The amount of outright grants from 1979 funds was 70 percent.

The cumulative percentage of UDAG funding used by grantees to make loans is 68 percent. The percentage of 1986 funds used as loans by grantees was 87 percent.

Senator PROXMIRE. I have to go. Unfortunately, they are in the last 5 minutes of a vote, but I will be back as quickly as I can.

[Whereupon, a brief recess was taken.]

Senator PROXMIRE. Mr. Secretary, when the loans are repaid, are there any restrictions on the further use of the funds or can they be used in any way the city desires?

Mr. PIERCE. They are supposed to be used for further development, I believe.

Senator PROXMIRE. Do you police that?

Mr. PIERCE. Yes; that is right, we do.

COMPOSITION OF HOMELESS POPULATION

Senator PROXMIRE. Yesterday, you had a dialog with Senator Mikulski regarding the makeup of the homeless population. In the course of yesterday's hearing, a HUD study of the homeless was alluded to. Your staff was kind enough to send a copy of the HUD homeless study to the committee staff. However, the study was dated April 23, 1984, almost exactly 3 years ago.

Wouldn't you say it would be difficult to draw any conclusions regarding the total number and composition of today's homeless population on the basis of a study that is almost 3 years old?

Mr. PIERCE. Well, no, because there have been other studies that have been more recent which have the numbers pretty close—around the same.

Senator PROXMIRE. Why can't we get those more recent studies?

Mr. PIERCE. I guess you can.

Senator PROXMIRE. The study we got was 1984.

Dr. KOCH. We in the government have not undertaken a more recent study, but Harvard did a study in 1986, and I think the outside reaches of the numbers were very close to ours; close to 350,000, also, in terms of national estimates. In Chicago——

Senator PROXMIRE. Before you get away from that, let me ask you, was the makeup of the homeless—that is what we are concerned about even more than the numbers—the numbers are very important, too, but how about the makeup? Did the Harvard study indicate that the composition was about the same as the HUD study?

Dr. KOCH. Yes; we all looked at this, plus the Chicago study that was also very recently done by the University of Chicago.

Senator PROXMIRE. What month and year?

Dr. KOCH. 1986.

Senator PROXMIRE. Early 1986?

Dr. KOCH. Published in September 1986. We all looked at the composition of the homeless. We found that two-thirds to three-fourths were single males. We found that around 21 percent were single heads of households. We all found a disproportionate group of minorities represented—ours and the Chicago and Harvard study. We all found a prevalence of mental illness. Our study said 22 percent; Harvard, 33; Chicago, 23 percent.

We all found a significant proportion of the homeless have alcohol and drug abuse problems. Ours said 38 percent; Harvard study broke it down to 29 alcohol abuse, 14 percent drug abuse; Chicago study, 33 percent had been in detoxification units.

We did not study those involved with the criminal justice system, but the Harvard study found 39 percent have admitted to spending time in jail, and Chicago also breaks it down in terms of those who have been involved with the criminal justice system and finds that 41 percent have had jail stays longer than 48 hours.

Senator PROXMIRE. What proportion were children?

Dr. KOCH. We don't have that in our study. We have the proportion of single heads of households with children; we have that broken down as 21 percent. The Chicago study says 10 percent of the homeless are dependent children; but we don't have for the nation the number of children in single-parent homeless families, so we don't have the proportion of the homeless who are children.

Senator PROXMIRE. How did you define homeless? Were the people who live in welfare hotels considered homeless?

Dr. KOCH. As we studied them, we defined those who were in shelters and we dealt with the entire shelter network that provides for the homeless.

Senator PROXMIRE. Senator Grassley, do you want to go ahead?

UDAG FUNDING FORMULA

Senator GRASSLEY. Thank you very much, Mr. Chairman. I appreciate it very much, particularly I appreciate it because at 11:15 a.m., the President is going to be up on the Hill, and I should be there even though I don't think he will be here to lobby me.

Senator PROXMIRE. Well, that is the price of being a Republican.

Senator GRASSLEY. No further comment.

Mr. Secretary, thank you, again, for being up here, and I know it is your job to be up here, and I know it is your job to answer a lot of tough questions. But, yesterday I said very positive things and I am not going to detract from them, but I do want your judgment on this UDAG program since you are in the position, because of the administration's decision that it has got to because of budget strictures.

Let me ask you, do you feel that if those budget conditions were not there, that if the deficits weren't as high, do you feel that this program does work and should, under those circumstances of having lower budget deficits or no budget deficit at all, that the program ought to continue under those circumstances?

Mr. PIERCE. Yes; I would say that the program should continue, if we didn't have the budget deficit problem.

Senator GRASSLEY. Do you think the UDAG funding formula change as suggested in the current bill, that means the authorization bill which passed the Senate last week, will help make this the national program that it was originally, and as I say, has become a kind of regional program lately?

Mr. PIERCE. Our position has been that we felt as though the Congress should define the boundaries because the current program, as you know, favors the Northeast and Midwest, and there are a number of Members of Congress who feel it should be more equally divided throughout the Nation. We have taken the position that Congress should have full and complete responsibility for defining the boundaries of this program.

We would be very glad to help them with the technicalities, but we do not want to make the decision, nor try to tell them what the boundaries of the program should be.

Senator GRASSLEY. OK; now I am exactly asking you if you favor exactly what the Congress did or not. That is not the position I am trying to put you into. As you view what we actually did, do you think that this will help the program become more of a national program?

Mr. PIERCE. Yes; I do.

UDAG PROJECT FUNDING CAP

Senator GRASSLEY. Would placing a cap on the amount of funding a UDAG project could receive make sense at this time? I might say, the Senate did that in its bill.

Mr. PIERCE. Well, that is very hard to do because once in a while something comes along that really deserves a sizable amount of money. It is very hard to put a cap on it.

Senator GRASSLEY. We did allow for some exceptions in our language. I don't want to go into detail about those, so it is not an absolutely firm, fixed cap of $6 million. Do you have some philosophical opposition to a cap?

Mr. PIERCE. Yes; I do. I would rather not see a cap. But what is done is done.

Senator GRASSLEY. I thank you, Mr. Chairman.

Senator PROXMIRE. Thank you.

Could I ask Dr. Koch, I would like to know if you could make a comment?

RENT BURDEN UNDER VOUCHER PROGRAM

Dr. KOCH. Yes; thank you, Mr. Chairman. I would like to add the following. As you summed up, our data so far indicates that indeed 50 percent of the voucher families seem to be paying in a range higher than 30 percent of income for rent. Our view is, our view has always been, that we hope they will be getting better quality housing.

We will not have data, national data, to support this until next year. We have data that is coming in now that is anecdotal and in a minute I would like to refer to the Oakland study.

I would like to say in regard to the Oakland numbers, we have no quarrel with the Oakland numbers. We have the same data and Mr. Demery will speak to what the Oakland Housing Authority director says about the significance of the somewhat higher voucher rents.

VOUCHER EXPERIENCE IN NEW YORK

In regard to the New York study that you questioned us about yesterday, I would like to say that we again have no problems with their numbers. They are similar to the numbers we ourselves are obtaining under the study, but there are two areas on which I would like to comment.

One is the success rate that New York is indicating to us is only about 30 percent. Nationally, we are seeing a 60-percent success rate in the use of vouchers and certificates. We are not sure yet what the lower rate means in New York. We could say that it indicates a tight market, yet the data that is coming in from other tight markets, from New Haven, from areas out West, indicate a high success rate for tight markets. So we will watch closely what the New York data actually means.

You raised the question of the higher subsidy costs in New York yesterday and I would like to clarify that. New York is one of nine states that is called an as-paid state. It has a provision that there is a maximum shelter allowance for AFDC families.

Under our statute regarding certificates, the PHA charges for the share a family has to provide the highest computation permitted under the U.S. Housing Act. That is, the PHA charges 30 percent of adjusted income, 10 percent of unadjusted gross income, or the maximum shelter allowance in an as-paid state.

So, for example, if rent was $400, under the 30-percent of income rule, the tenant might be required to pay $200 and the subsidy would be $200. In New York, the shelter allowance might be, for example, $250, and so the PHA would set that as the tenant share of the rent and the subsidy would only be $150.

What is happening really in the certificate program is the subsidy is larger from the HHS moneys that flow through in New York, and the HUD subsidy, therefore, is smaller. The HUD subsidy is larger for voucher holders in New York because the voucher program does not have the same rule about AFDC shelter allowances in as-paid states. There are nine states that have similar kinds of situations.

What could be done is that since this section was left out of the voucher legislation, it could be adjusted so that certificate holders and voucher holders in these states could pay the same amount.

Senator PROXMIRE. Thank you, very much.

VOUCHER SITUATION IN OAKLAND, CALIF.

Dr. KOCH. I would like to call on Mr. Demery to give you information on the Oakland situation.

Mr. PIERCE. He has made a call to Oakland and would like to put on the record what his conversation was with the PHA out there.

Senator PROXMIRE. Thank you.

Mr. DEMERY. Thank you, Mr. Chairman. The point that you raised yesterday with respect to vouchers in general and Oakland in specific dealt with the concept of rent gouging; which is a concern that I have heard raised by other people at various times over the last few weeks.

The whole concept of rent gouging as discussed yesterday and in the context of the Oakland study was a little baffling to me so I really appreciated the report that you gave us. We spent a lot of time yesterday contacting the people in Oakland directly to find out what is going on.

We subscribe, and the whole voucher program is based on the premise that people, no matter what their economic circumstances, be they wealthy or not-so-wealthy, are really motivated first by their own self-interest. If given a choice between spending more money or a greater percentage of their income for housing, people are going to be the judges of whether or not they are going to spend that additional sum of money.

That is exactly the way the voucher program was designed and that is exactly what we are trying to do with the voucher program. The government doesn't need to restrict or to tell people how to spend their money, if they are capable of making those determinations.

In the Oakland study that was supplied us, an interesting example starts with the studio voucher rents. The rents to the owner of $382 for vouchers versus the section 8 rents of $335.

There is almost a $50 differential between the two. The voucher rents were 14 percent above the section 8 rents, as this little report indicates. One could quickly, and it is turning out to be mistakenly, conclude that the voucher holders are being penalized, that they have to pay more in rent.

What we did was contact the Oakland PHA and we said——

Senator PROXMIRE. That was not my conclusion. My conclusion was the taxpayer was being penalized.

Mr. DEMERY. There are two separate issues; the rent gouging issue is that the tenants are paying more than their fair share.

What we found out is that 89 families were eligible for studio units and received, in effect, a studio voucher. However, 81 of the 89 studio voucher holders shopped around and they leased a one-bedroom unit—they rented up, exactly what Dr. Koch was talking about.

Senator PROXMIRE. I apologize, but there is a vote on the floor, and they are in the last 5 minutes. I am going to have to run to vote. I haven't missed a vote in 21 years, the longest in the history of the U.S. Senate. I will be back shortly.

[Whereupon, a brief recess was taken.]

Mr. PIERCE. Mr. Chairman, I would appreciate it if I could be excused at this time. I have to go to a luncheon at the State Department; it is relatively important.

Senator PROXMIRE. Could you appoint someone who could speak for you?

Mr. PIERCE. Yes; I will.

Senator PROXMIRE. We do want to complete the hearings this morning on your Department.

Mr. PIERCE. Mike Dorsey will speak.

HOMELESS PROGRAMS

Senator PROXMIRE. Thank you.

Mike, the Department is requesting $5 million for the Transitional Housing Demonstration Program for the homeless and plans to shift the Emergency Shelter Grants Program to the Federal Emergency Management Agency.

As you may know, the House Appropriations Committee recently reported legislation providing an additional $30 million for the Transitional Housing Demonstration Program and a further $100 million for the Emergency Shelter Grants Program.

Can you give us a status report regarding what has been accomplished with the $15 million we provided last year for these two programs?

Mr. DORSEY. Yes, Senator. The first is the Transitional Housing Program, and I think Tom Demery of the Housing Program has a report on that.

Senator PROXMIRE. Mr. Demery, go ahead.

Mr. DEMERY. I will be happy to submit the rest of my formal remarks for the record, in the interest of time. You caught me in midsentence there.

The transitional housing demonstration, the notice of the proposed guidelines, was published in the Federal Register on February 25, and the final guidelines will be published within the next 2 weeks.

We expect that the current appropriation will be obligated by the end of this fiscal year with all projects operating by December 1987.

VOUCHERS IN OAKLAND

Senator PROXMIRE. I would like to follow up on that Oakland response, since you are right here. The point I was trying to make yesterday is that the Oakland experience, to date, with the vouchers, was that in every category from studio to four bedroom, it was above section 8, varying from 14 to 22 percent. That was with respect to contract grant.

Housing assistance payments, again, that was above section 8 in every category ranging up to 30 percent.

In the study it said the following: "Our fifth operational quarter for vouchers shows the program has been proving a solid moneymaker for the Oakland Housing Authority." Of course, they like it—why not? They like it, the people who occupy these homes don't suffer—who does? It is a zero-sum game and the taxpayer is the fall guy.

Mr. DEMERY. If I could respond. The contract rent part is what we talked about before in terms of the rent gouging burden to the tenants, and we have discussed that. The housing assistance payment ratios that you mentioned are basically done for the first year, and the way the voucher program is constructed, as you know, a payment standard is set two times over the 5-year period, as opposed to annually under the certificate program.

Because there are only two adjustments in a 5-year period, it was expected that the first year or so of the voucher program would be slightly more expensive than the certificate program. However, when you look at it over a 5-year period, Senator, we believe that the data will show that the voucher program, in fact, could be less expensive than the certificate program, looked at over the life of the 5-year contract.

So while the numbers are correct in the first year experience of the cost of the housing assistance, it will even out over the 5-year term.

What was the third point?

Senator PROXMIRE. Those are really estimates; you don't know. Only time will tell; isn't that right?

Mr. DEMERY. Yes.

Senator PROXMIRE. Let me ask, focusing on just the transitional——

ADMINISTRATIVE FEES FOR VOUCHERS AND CERTIFICATES

Mr. DEMERY. Oh, yes, that brought to mind what the third point was—the moneymaking aspect of the administrative fee that they reported.

Senator PROXMIRE. Yes; a big moneymaker.

Mr. DEMERY. It is a big moneymaker at 6.5 percent. They are making 50 cents a unit, if I am not mistaken, in terms of profit.

Senator PROXMIRE. They are making more now that the rates have been adjusted; isn't that right?

Mr. DEMERY. They are making slightly more under the certificate—now, wait. I am getting confused here.

They are making slightly more under certificates than they are under vouchers because they are being paid more at the current fee level.

Mr. DORSEY. Senator, if I may, I think the point is that the fee structure presently in the law is higher for section 8 than for vouchers. But I think that this Oakland report indicates, as the administration has been saying for several years, that the voucher fees are high enough for the housing authority to make money and that we should not adjust the voucher fee upward to the section 8 fee, but rather we should adjust the section 8 fee downward to the voucher fee.

Senator PROXMIRE. Whatever the conclusion, it seems to me on the basis of the information you have supplied before, that this is a situation in which the taxpayer does not benefit from the voucher program.

Mr. DEMERY. Not in the first year.

POSSIBLE USER FEES FOR RESEARCH REPORTS

Senator PROXMIRE. Let me ask you another question. You are requesting $18.9 million for policy development and research. That is 11 percent over the current estimate. You plan to spend $12.4 million on housing market research. This includes routine support for five major surveys conducted with the Bureau of the Census.

These surveys produce monthly, quarterly, and annual housing and construction reports. In your justification, you indicate that most of this data is used by financial institutions, the construction industry, and related industries such as the home furnishing business and utility supply and residential energy needs.

My question is this: Have you given any thought to the development of a user fee for this data, since the major data users are profitmaking industries which could easily, as a group, underwrite the cost of this data collection and benefit from the information?

Mr. DORSEY. I will ask Dr. Koch to respond.

Dr. KOCH. I would like to point out that that survey is absolutely essential to the Department for all the analysis that we do on housing, both homeowners and renters. We are a great user of the American Housing Survey.

In regard to a user fee, no, I had not, and I don't think it is a bad idea. I think I would like to give some thought to it.

Senator PROXMIRE. It would be very helpful if you would. You say you are a user, and that would suggest that it might not have to cover the entire cost, but it might be helpful to cover part of it.

That seems to be a policy of the administration and I think it is a good policy. People who benefit should pay, rather than the general taxpayer. Somebody has to pay.

Dr. KOCH. I think it is certainly worth thinking about.

SALARIES AND EXPENSES

Senator PROXMIRE. You are requesting $310 million for management and adminstration, a reduction of $30 million below your current budget. I note that last year you returned about $10 million to the Treasury from the account, and that is certainly understandable when considered in the context of a budget of over $300 million.

However, in 1985, you returned only about $3 million to the Treasury. Can you tell us why you returned so much more to the Treasury in 1986, despite the Gramm-Rudman-Hollings across-the-board cut, than you did in 1985?

Mr. DORSEY. Mrs. Hoffman will respond, Senator.

Mrs. HOFFMAN. Yes, Mr. Chairman. The reason we returned more is that we got a salaries and expenses supplemental in September 1986.

We got the supplemental so late in the year that we could not use all of the funds that were given to us.

STAFFING REQUEST FOR DEPARTMENTAL MANAGEMENT

Senator PROXMIRE. Now while you are requesting a cut in the total HUD budget, I note that you are proposing an increase of 8 staff-years and about $520,000 for the departmental management function, about 6 percent above current levels. Most of that increase would occur in the immediate Office of the Secretary, and Under Secretary, which would jump from 21.8 staff-years in 1987 to 28.8 staff-years in 1988.

In an organization as large as yours, this is small potatoes. However, I would think you would want to set an example when you are proposing cuts in a majority of your programs and an overall staffing cut of 117 staff-years. Can you tell us why you, in this office, need that increase?

Mrs. HOFFMAN. Mr. Chairman, it does look like there is an increase going from 1987 into fiscal year 1988. However, the Secretary's Office was given a disproportionate cut in 1987 and the budget proposes that the cut be restored. The Secretary's Office has sustained its fair share of cuts since fiscal year 1981.

Senator PROXMIRE. I want to welcome the distinguished Senator from New Jersey, Senator Lautenberg, to the subcommittee.

HUD PARTICIPATION IN PRODUCTIVITY IMPROVEMENT PROGRAM

In February 1986, the President established a Comprehensive Productivity Improvement Program and set a goal of 20-percent improvement by 1992. That program was created by Executive Order 12552 and implementing instructions were issued by OMB in February of last year.

Can you tell us what initiatives you are pursuing under the program?

Mrs. HOFFMAN. Yes, Mr. Chairman. We set up an Office of Productivity and Management Improvement in my office 18 months ago. They have undertaken a number of productivity studies that have proven very worthwhile.

Senator PROXMIRE. Can you tell us specific initiatives that have been especially useful?

Mrs. HOFFMAN. Yes, sir; we have done a productivity study in the office of single-family housing processing for the title I program.

STEPS TAKEN TO IMPROVE PRODUCTIVITY

Senator PROXMIRE. I am not talking about the studies. I am talking about the steps that you were able to take to improve your productivity in response to the studies. The tangible results, or projections, at least, if you don't have that.

Mrs. HOFFMAN. There were specific recommendations in the title I program that have improved our debt collection, while reducing the staff. We have also done a number of other things. We have initiated electronic transfer of funds for payment of single-family claims, which means that moneys are going directly into financial institutions. Further cash management initiatives since 1981 have resulted in savings of over $200 million for the Treasury.

We have reduced our single-family claim processing from 6 months down to 5 days, thus saving the government the interest costs while we are processing claims. It also allows us to reduce staff, or have the staff work on other types of projects.

Those are the type of discrete things that we have accomplished.

Senator PROXMIRE. Those are very impressive, but can you tell me what proportion of your Department's operations are covered by these initiatives in terms of the number of staff and the functions being improved?

Mrs. HOFFMAN. We have numbers, Mr. Chairman, that we can give you that cover the number of employees that the studies that we have done cover through the Department. We can supply that for the record.

[The information follows:]

PERCENT OF HUD EMPLOYEES COVERED BY PRODUCTIVITY IMPROVEMENT PROGRAM

The Department of Housing and Urban Development has a 5-year productivity improvement plan which establishes the agency's agenda for accomplishing the President's objective in the area of productivity. The plan lists all program functions which have impact on the public and a schedule of studies to find ways to achieve the 20-percent productivity improvement goal. In keeping with the spirit of the executive order, support functions, including most administration and other staff support functions, are not included in the productivity plan. Of course, productivity improvement will be targeted in those areas, but they are not included in the 5-year plan.

The studies conducted to date and the percent of HUD's FTE's covered by each are shown below:

Program	*Percent of HUD's FTE's*
Title I	2.9
Distributive shares	.2
Single-family application processing	11.6
Single-family claims processing	.4
Single-family loan management	4.6
Total	19.7

The Department's productivity improvement plan includes 27 program areas, some specific and others more broad, to be studied. Employees assigned to these areas make up approximately 65 percent of the Department's work force. Additional areas may be added as the program continues.

A-76 STUDIES

Senator PROXMIRE. Have you made any productivity gains in the area of privatization through the so-called A-76 studies?

Mrs. HOFFMAN. Yes, sir; we have.

Senator PROXMIRE. Can you give us an indication of roughly what they amount to?

Mrs. HOFFMAN. We can provide complete information for the record. We have contracted out our library function and several other functions.

[The information follows:]

SAVINGS RESULTING FROM PRIVATIZATION

The following table shows dollar and employment savings, for a 3-year period, which have been realized as a result of privatization:

PROJECTED 3-YEAR SAVINGS

Activity	Dollars	Employment
Computer room operations	792,000	30
Library operations	502,000	19
Courier services	109,000	2
Total	1,403,000	51

Senator PROXMIRE. Were productivity gains significant?

Mrs. HOFFMAN. Contracting out yields dollar gains, sir. Yes; they were.

HOLDING MANAGERS ACCOUNTABLE FOR PRODUCTIVITY IMPROVEMENT

Senator PROXMIRE. The General Accounting Office has shown that an important element of the successful productivity program is to hold managers accountable for achieving specific productivity goals. One way of achieving that is through their merit pay performance or SES contracts.

Do you hold managers accountable for productivity improvements, and if so, how is that done?

Mrs. HOFFMAN. Yes, sir; we do it through their performance standards. They are issued standards every year which state what they are supposed to do during that year.

AWARDS FOR PRODUCTIVITY IMPROVEMENTS

Senator PROXMIRE. Have you made major awards for productivity improvements?

Mrs. HOFFMAN. Yes, sir.

Senator PROXMIRE. How many awards have you made?

Mrs. HOFFMAN. Off the top of my head, I don't know. But, yes, sir, we have given out awards.

Senator PROXMIRE. Give me an example or two.

Mrs. HOFFMAN. Well, the Treasury Department just last week awarded two of our employees—one in the Office of Title I in single family, and one in my Office, Finance and Accounting—for the savings achieved for their respective programs. Their recommendations can be applied governmentwide, primarily in the area of cash management initiatives.

Senator PROXMIRE. Are productivity goals incorporated into SES contracts and pay plans?

Mrs. HOFFMAN. Yes, sir; they are.

Senator PROXMIRE. Do you share productivity savings with employees, and if so, how is that done?

Mrs. HOFFMAN. Yes, sir; we send out a summary of all of the incentive awards that are made, and the reasons they were made. In addition, my staff prepares a listing of all of the productivity improvements initiated in the Department, which is disseminated to all employees.

HUD RECORD IN EMPLOYING FEMALES AND MINORITIES

Senator PROXMIRE. Now, in the past, HUD had a better record than some agencies with respect to minority employment, but there was a sharp discrepancy between males and females, particularly in the higher grades.

For example, when I last chaired the subcommittee 7 years ago, the Department had only 14 females in its executive level and senior executive service, while 110 males occupied these positions. Has the picture changed any since then, and what is the breakout now for these positions?

Mrs. HOFFMAN. We have an excellent record, specifically in the SES. We do have that information.

The percentage of female employees in the SES is 14.4 percent of the total that we have in the Department. We have 120 SES positions authorized by OPM; approximately 114 of those positions are currently filled.

Senator PROXMIRE. That is about what it was 7 years ago. That seems to me to be pretty small. That is——

Ms. HOFFMAN. In 1979 it was 12.4 percent, Mr. Chairman.

Senator PROXMIRE. And now it is about the same.

MINORITY GAINS IN LOWER GS LEVEL

Mrs. HOFFMAN. Now it is 14.4 percent. The real gains in the Department, Mr. Chairman, have been in the lower grades which lead up to the higher grades.

Senator PROXMIRE. You are talking about the total GS-12 and above population?

Mrs. HOFFMAN. Yes, sir; if you look at those comparisons, where you have the people moving up through the ranks who will go into executive positions, we have done much better.

Senator PROXMIRE. Give me the figures.

Mrs. HOFFMAN. For instance, in 1979, 25.8 percent of GS-11's were female. Today the figure is 47.4 percent. If you look at grade 13, it was 17.2 percent and now it is 27.7 percent. Grade 14 was 13.8 percent; it is now 19.2 percent. Grade 15 was 12.2 percent; it is now 16.3 percent. This indicates that the Department has really done an excellent job of promoting women into those grade levels.

Senator PROXMIRE. I think you are doing a better job, but I would not call it excellent. It is still a relatively small proportion of the higher grades when you get above GS-12.

Mrs. HOFFMAN. If you compare HUD to the rest of the government, Mr. Chairman, and I would say even to the private sector, HUD is head and shoulders above them. There are only one or two other agencies in the federal government, and I think it is only one other agency that has a record equal to or better than HUD's.

Senator PROXMIRE. Undoubtedly you are right about that. I have been trying to determine what I think is discrimination against women and minorities, and I think this is a better record. No question about it, but it is not as good as it ought to be.

Let me ask you, what is the percentage of minorities employed at the GS–12 and above?

Mrs. HOFFMAN. 12.6 percent, sir.

Senator PROXMIRE. How does that compare with 1980?

Mrs. HOFFMAN. In 1980 it was 9.2 percent.

Senator PROXMIRE. So it is an improvement of 9 to 12, roughly?

Mr. KLIMAN. The minority figure in 1980 for grade 12 was 25.9 percent; in 1986, it was 32 percent.

Senator PROXMIRE. Twelve and above?

Mr. KLIMAN. That was for grade 12 specifically. At GS–13, the percentages went from 21.5 to 29.1; at GS–14, it went from 18.4 to 19.8; GS–15 was stable at 16.3 percent.

Senator PROXMIRE. What proportion of your employees are in the Washington area?

Mrs. HOFFMAN. We have approximately 12,400 people on the rolls, of which about 3,400 are at headquarters. That is about 27 percent.

UPWARD MOBILITY PROGRAMS

Senator PROXMIRE. Does the Department still have its own Upward Bound Program as a way of promoting staff from clerical positions into professional/technical positions?

Mrs. HOFFMAN. Upward mobility programs; yes, sir.

Senator PROXMIRE. How many graduates were there last year of your Upward Bound?

Mrs. HOFFMAN. I don't have that here, Mr. Chairman. We can provide that for the record.

Senator PROXMIRE. Also provide for the record, unless you have it off hand, the number of graduates who were female.

Ms. HOFFMAN. We can provide that for the record.

[The information follows:]

UPWARD MOBILITY

The following table provides the number of HUD's Upward Mobility graduates for 1985 and 1986:

	1985	1986
Female	43	83
Male	5	9
Total	48	92

Senator PROXMIRE. I want to thank you, very much.

SUBCOMMITTEE RECESS

The subcommittee will stand in recess until Thursday, April 9, when we will take testimony from the National Aeronautics and Space Agency.

[Whereupon, at 11:50 a.m. Thursday, April 2, the subcommittee was recessed to reconvene at 10 a.m. Thursday, April 9.]

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT-INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1988

THURSDAY, APRIL 9, 1987

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10:07 a.m., in room SD–124, Hon. William Proxmire (chairman) presiding.

Present: Senators Proxmire, Johnston, Lautenberg, Mikulski, Garn, D'Amato, Grassley, and Nickles.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

STATEMENT OF JAMES C. FLETCHER, ADMINISTRATOR, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ACCOMPANIED BY:
- C. THOMAS NEWMAN, ASSOCIATE ADMINISTRATOR
- DALE MYERS, DEPUTY ADMINISTRATOR
- RICHARD TRULY, ASSOCIATE ADMINISTRATOR FOR SPACE FLIGHT
- SAMUEL KELLER, DEPUTY ASSOCIATE ADMINISTRATOR FOR SPACE SCIENCE AND APPLICATIONS
- ANDREW STOFAN, ASSOCIATE ADMINISTRATOR FOR SPACE STATION
- RAYMOND COLLADAY, ASSOCIATE ADMINISTRATOR FOR OFFICE OF AERONAUTICS AND SPACE TECHNOLOGY
- BOB ALLER, ASSOCIATE ADMINISTRATOR FOR SPACE OPERATIONS
- JUNE GIBBS BROWN, ASSOCIATE ADMINISTRATOR FOR MANAGEMENT

CHAIRMAN PROXMIRE'S OPENING REMARKS

Senator PROXMIRE. The subcommittee will please come to order. Today we will hear from Dr. James Fletcher and his associates regarding the fiscal year 1988 budget of the National Aeronautics and Space Administration.

NASA is requesting $9.5 billion for the coming fiscal year, or a reduction of $953 million below the current budget. However, it should be noted that the current appropriation includes $2.1 billion for the purchase of an orbiter to replace the one lost in the *Challenger* disaster.

Consequently, the request we are discussing today is considered by many, including the Congressional Budget Office, to be well above the current baseline.

Today's hearings will have as a primary focus the planned space station. I want to try to get a realistic estimate as to whether we can pay for the station as presently configured and still support other vital space activities. A real danger in a time of limited resources is trying to do too much with too little, instead of concentrating on a limited number of objectives and moving with maximum efficiency.

I particularly want to avoid a repetition of the space shuttle scenario, which found NASA desperately trying to meet cost and performance targets that were totally unrealistic.

As you know only too well, Dr. Fletcher, I presided over many hearings in the formative days of the shuttle and was told over and over again that the shuttle was the greatest thing since sliced bread. Back in 1975, when a General Accounting Office study talked about deferring shuttle work to meet predetermined cost ceilings and thus increasing the risk to overall cost, schedule, and performance requirements, you told us that the study "could be seriously misleading on the development status of the shuttle and NASA's cost commitment to develop the shuttle for $5.2 billion." The following year, you told the subcommittee, "The fact is that we can go ahead with the space shuttle and can launch all of the known payloads in the future. We think it is quite reasonable to assume that the flight rate would go up to 60 per year."

I might add that in 1983, then Deputy Administrator Hans Mark referred to these kinds of estimates as an inflation of the mission model "beyond any realistic limits in order to reduce the apparent cost per flight of the shuttle."

I don't say these things to embarrass anyone. After all, the Congress accepted your rosy estimates. However, we learn by our mistakes, and I think we all have to make sure this time around that we don't proceed with a space station on the basis of underestimated costs and overestimated performance.

Having made those remarks, let me assure you, Dr. Fletcher, that I look forward to exploring NASA's future with you today. We are honored, and a little intimidated, by the fact that we have with us as the ranking member and former chairman of this subcommittee, an old friend of mine and a man who is an expert in space as few Americans can be, having been out in space himself, and I am delighted to defer to him as the ranking member.

SENATOR GARN'S OPENING REMARKS

Senator GARN. Thank you, Mr. Chairman. I would be happy to switch with you if you feel uncomfortable.

Senator PROXMIRE. I am not that intimidated.

Senator GARN. I do appreciate the opportunity of being here today, and Dr. Fletcher, it is a pleasure to welcome you before the committee.

DEFENSE OF THE SPACE PROGRAM

You are undoubtedly under very difficult circumstances. The last year, I think for obvious reasons, NASA and everyone else has had to be preoccupied with the *Challenger* disaster and recovering from that particular disaster. And I am also very well aware that for a long time I have been accused, certainly by some members of the press, of blindly defending NASA.

I make no apology for my defense of NASA because I don't consider it a defense of NASA. I consider it a defense of the space program of this country in the future, a long time after Chairman Proxmire and I are gone and there has been two or three more administrators. That is what I have been trying to look for, to put my defense in perspective.

I looked back at what we were doing back in the days of the Moon landings, the Apollo landings. The euphoria that went with that, and the blank check that Congress was willing to give for those flights to the Moon.

And then I look at how dramatically we have pulled back and how, in terms of expenditures of space exploration and development, that we spend less in this country for space than we do for chewing gum and candy bars, and we spend only about one-half on space exploration and development what we spend on food stamps in this country.

BENEFITS FROM SPACE

When we look at what a very small proportion of the budget we spend, considering the fact that we have more than 12,000 medical devices or procedures developed directly or indirectly from space research and development. I don't know how you place a price tag or a value on a human life, on those who are alive because of pacemakers, or new insulin pumps that are now being used with diabetics, and surgical procedures.

I really don't know how we can sit here in Congress and talk about NASA's expenditures in terms of a payback when you can't place a price tag on human life. And even if you don't do that, if you look at products that we use every day in the commercial field, in communications, in navigation. I will never forget in my first press conference, after my flight, when Colonel Bobko, my commander, was asked what would be the first planet that we would explore from space? He said, "The Earth, of course."

I don't think most people realize that. We have been exploring the Earth. We have learned far more about our Earth from low Earth orbit than we ever have from walking on the surface of it.

I am not a scientist, but I had Earth observation classes, geology and volcanology, and oceanography, and so on, and it is absolutely remarkable what you can learn when you can look at it from that distance, where you can see the geographic features of the Earth.

The photography alone; 1,900-some odd pictures we took for various scientific disciplines in this country, at various Sun angles, and so on. The wealth of knowledge that we are getting, and yet from OMB, and from this Congress, we are always counting beans.

There is very rarely any discussion of the benefits for every man, woman, and child on the face of this Earth. That is what I have been defending and will continue to do so, and make no apology, or not be intimidated for trying to defend the future of the space program in this country because there are so many problems, social and political and otherwise, that at least in this Senator's opinion, can be solved from what we learn in science from outer space.

Having said all of that, it doesn't mean we can't be more efficient. There is some waste and inefficiency in NASA as there is in every other department of this government and we can do it better; there is no doubt about that. And we should learn from our mistakes.

But I guess it bothers me how good our hindsight is, as well. There is no doubt that your estimates, Dr. Fletcher, and those of NASA's, were way under what the shuttle has cost. There is no doubt that the space station estimates are much higher than originally perceived, and I would be willing to bet before we ever have a space station it will double again.

It is not a matter of anybody's sincerity, but as I look back to 1971, you can look at projections when we asked people what would the cost of a house be in 1987. Now that is not exotic technology. It is brick and it is mortar and it is wood, and if anybody would have anticipated that the average price of a house in Washington, DC, area would be over $100,000, everybody would have laughed them out of the room.

If somebody had told me in 1971 that just a good old ordinary car cost $16,000 or $17,000, who could conceive of that? I can remember when my father took me to see a Cadillac. He was going to buy a Ford, and he showed me a Cadillac that cost $2,800. He said, "Can you imagine that? $2,800 for an automobile."

Go back to 1971, and what people would estimate the cost of the staff of the Senate of the United States would be, or committee budgets. I mean, we are so far out of line. Who is calling the pot black?

Look at our own estimates; over, and over, and over again they are off so far it is ridiculous. We are talking about known items. We are talking about personal costs and automobiles, and yet somebody back in 1971 is supposed to estimate accurately the cost of the most complicated technological vehicle man has ever built, a reuseable spacecraft.

And we are going to sit up here as critics and say, "You stupid oafs. Look at what you did back then. You could not make an estimate for 1987 of what it was going to cost."

Now, I don't know how we do that. I am not a scientist and I don't have the background most of you gentlemen do, but I don't know how anyone can sit here today and be held down to an exact figure for a space station in the mid or late 1990's, or the potential cost of Mars mission when you haven't yet invented the parts and the equipment and the things that are going.

We are talking about new technology on the absolute edges of science, of doing these things, and yet we are supposed to make accurate estimates. CBO can't do that, OMB can't do it, the President can't do it.

Look at our estimates. I came here 12 years ago and Gerald Ford requested a budget of $295 billion, and we passed $318 billion. I thought, good heavens; $300 billion in 1 year. Now, we have a $1 trillion budget and $2 trillion deficit. Nobody anticipated that.

Senator Proxmire and I have sat in the Banking Committee for 12 years together. We have had the opportunity of listening to the world's best economist on every side of an issue for 12 years and he would agree with me on this statement, that every January they come back and tell us why their projections were wrong from the previous year—just 12 months before.

Isn't that what they do every January? They start out with their testimony—well, the reason what I said last year didn't happen is because of this, and this and this.

Yet we are supposed to make accurate estimates for a space station for 12 years down the road, or supposed to have been accurate in 1971 for a space shuttle. I am not condoning any waste or inefficiency or saying we couldn't have done a better job, but let's not kid ourselves: In this kind of science, no one—no one, and I don't care how bright they are—can accurately pin down costs a decade or 15 years down the road on something that has not yet been invented, or not yet been built if we can't do it in good old ordinary things like houses and automobiles and other things.

I hope we will get more realistic about what space can do for us rather than what the bean counters like down at OMB. I would like to send a few of them into space on a one-way trip and leave them out there permanently orbiting. They can count their beans and play with their green eyeshades and their black armbands all day.

Without looking at some policy and without looking at the return and the benefits every man, woman, and child on the face of this Earth, from the science and the space applications that we will learn.

Charlie Walker on my flight was running an electrophoresis machine, and I am not quite sure what that green liquid was running around in that machine because he wouldn't tell me. I spent 7 days in space with the man and he wouldn't tell me. I wish we could have people in Washington who could keep their mouth shut like that.

But all I do know is that we can process pharmaceuticals 100 times more efficiently in zero gravity and 4 times more pure, and some day we will cure major diseases because we have scientists up there that can work in a space station and produce medicines that will solve the problems of cancer and a lot of other diseases. How do you place a price tag on that?

You can, in a way, with the enormous tens of billions of dollars of costs that we spend in hospitals and nursing homes of this country, the enormous drag that is on our budget—and yet we only spend $7.5 billion or so on space getting there, so that we can solve some of these problems.

I am sorry, Mr. Chairman. I didn't expect to get on such a soapbox, but I want it placed in this record of what is to be gained out there, and while we are being efficient and trying to hold NASA's feet to the fire and make them do better jobs—which I am all for—let's look a little bit at the goal and some long-term policy and what science in space can do for us. If nothing ever happened out there but Charlie Walker's electrophoresis machine worked, and we found a drug that would cure cancer, I think that might be worth a billion or so a year extra, or a little waste and inefficiency.

I am not going to be intimidated or pushed around or be made to apologize for my defense of the space program or this future when I can sit back in a rocking chair and am a little bit senile, and all spaced out again from a different reason, and look at some of the accomplishments and the benefit to mankind because of some of the decisions we have made here this year and next year and the year after.

Thank you, Mr. Chairman.

Senator PROXMIRE. Thank you, Senator Garn, for a very strong statement. There is no question where you stand.

Senator Grassley.

Senator GRASSLEY. Mr. Chairman, I have no opening statement.

SENATOR NICKLES' OPENING REMARKS

Senator PROXMIRE. Senator Nickles.

Senator NICKLES. Mr. Chairman, I have no opening statement except that I would like to welcome our panel. I look forward to hearing their statements this morning, but I, for one, have been concerned that the disaster we had with the space shuttle has slowed down our program and taken far too much momentum away from the program.

It has delayed the next shuttle launch far too long, at least from this unscientific observation. I would like to see us move forward much more aggressively and much more quickly, as soon as possible, and certainly as safely as possible.

But to have a 2-year delay—and I am sure the Administrator will bring us up to date—seems to me to be an inordinate amount of time from the last disaster to when we will have to next shuttle launching.

I would hope we would be able to move forward as quickly as possible. I think the budget request that we are looking at, there are significant increases primarily for the space shuttle, and I guess for the plane, and I am interested in knowing how much is in the budget for the space plane—the *Orient Express*. I am interested in knowing how much is in the budget for that vehicle, as well for the space station.

Thank you, very much.

SENATOR D'AMATO'S OPENING REMARKS

Senator PROXMIRE. Senator D'Amato, do you have an opening statement?

Senator D'AMATO. Mr. Chairman, so that we can hear from the witnesses today, I would ask permission to submit my statement as if read in its entirety.

Senator PROXMIRE. Without objection, so ordered.
[The statement follows:]

STATEMENT OF SENATOR ALFONSE D'AMATO

Mr. Chairman, I am pleased to join you for this hearing on the fiscal year 1988 budget for the National Aeronautics and Space Administration.

For fiscal year 1988, the President has requested a NASA budget totaling $9.481 billion. This budget request will enable NASA to proceed toward the resumption of space shuttle flights in February 1988, while also beginning to develop a permanently manned space station. In addition, the budget request allows NASA to continue its vital programs in space science and applications. America's commitment to these and other programs of the National Aeronautics and Space Administration will help restore this nation's continued position of leadership in space.

Mr. Chairman, I am pleased that the administration has placed top priority on returning the space shuttle to flight status. The budget request of $3.1 billion for the space transportation system will provide for the continued modification and testing of the solid rocket booster as well as further implementation of the Rogers Commission recommendations.

The fiscal year 1988 budget request also includes $767 million for the design and development of a permanently manned space station. This request sends a clear signal to our international partners that the United States is strongly committed to this venture. It also shows the private sector that future investments in commercial space activities are under serious consideration.

Mr. Chairman, the fiscal year 1988 NASA budget, by focusing on returning the shuttle to safe flight and on moving forward with the space station, significantly strengthens our commitment to U.S. leadership in space. A continuing commitment to space exploration and development will make America stronger and more prosperous, providing technological benefits and long-run economic opportunity.

Thank you, Mr. Chairman.

Senator PROXMIRE. Senator Lautenberg had to leave for another hearing; he has questions for the record.

I see you have a rather lengthy statement. You may summarize if you wish with the knowledge that it will be printed in the hearing record in its entirety.

We would like to get into questions as soon as we can. We welcome you; you may go right ahead.

PAST YEAR'S ACCOMPLISHMENTS

Dr. FLETCHER. The statement will be submitted for the record, Mr. Chairman. Let me just cover the highpoints of that statement, and maybe comment on some of the comments made earlier.

We are well down the road in our efforts to recover from the *Challenger* disaster. We are getting the space program back on track, recovering from the *Challenger* accident.

Difficult though this past year has been, and believe me, it has been very tough, it has also been a year, internally, of rebuilding and a year of strengthened resolve to return the nation to the forefront of space activity, both safely and reliably.

Some of the things we have accomplished in the last year I would like to recount, but before saying that, I have to say that we have a long ways to go before we are back on track. We will deal with some of those, I am sure, as we go along.

We have stabilized our program and improved the ways we managed the space shuttle and the space station program. We have initiated a comprehensive NASA management reorganization plan and we are well on the way toward implementing that plan.

We have strengthened the safety, reliability, maintainability, and quality assurance functions in a consolidated organization under George Rodney, a new associate administrator for that function. We are preparing in a careful and orderly way for the resumption of shuttle flights in February 1988, but there are a lot of threats to that schedule and we would be happy to discuss those threats. We are still holding to that date at the moment, but we are not going to fly until we are convinced that it is a safe thing to do.

We plan to initiate the development phase of the space station during fiscal year 1987, as was mentioned. We are continuing our space science and applications and other programs vital to the expansion of human knowledge.

We are focusing renewed effort on building the technology base for greater accomplishments in space in the future, and you may want to discuss that. We are further strengthening the technology upon which our leadership depends.

Although we still have many problems that are not resolved, and a long way before we get the space program back on track, we have presented to the Congress what I think is a reasonably balanced space program, even though conceived in an environment, as you know, of severe fiscal constraint.

OVERVIEW OF NASA'S FISCAL YEAR 1988 BUDGET REQUEST

I would like to give you some highlights of the budget request. The request gives top priority to returning the shuttle to flight status by correcting the solid rocket motor defects and other weaknesses in the program that we have identified.

The budget further implements the recommendations of the Rogers Commission to enhance our ability to sustain a safe and effective operation of the shuttle; the Rogers Commission recommendations were extra things that we felt we needed to do before we returned to flight.

The budget provides for the production of a replacement orbiter, and we got, as you know, the full funding for that in fiscal year 1987.

SPACE STATION

The budget requests $767 million for the space station which supports a substantial and steady progress in meeting the President's goal of an operational capability in the mid-1990's.

Last Friday, Mr. Chairman, as you know, the President reconfirmed his commitment to the space station as the next logical step in space by authorizing us to proceed with a phased development of the space station. Because of the increased cost, we are going to do it in chunks and the first phase will be a very useful first phase. We call it Block One, with a good bit of the capabilities of the fully described space station described last year.

SPACE SCIENCE AND APPLICATIONS

In space science and applications, we are pursuing a strategy which carries space science and applications program through this difficult hiatus in space shuttle flights. For example, we are considering the options, and there are many of them, but all of them require expendable launch vehicles for the planetary program, which has been severely impacted by the shuttle accident.

Last Friday, we announced that the Galileo, for example, will be launched from the shuttle in November 1989, with Ulysses in 1990. The Mars Observer will be launched by the shuttle in 1992, and we will maintain our critical research base needed to analyze the data from our operating missions. That is part of what we call a vitality package.

The vitality package consists not only of analyzing data, Mr. Chairman, but also enhances our capability in the suborbital program; that is, rockets, balloons, and we have a C–140 aircraft—we call it the Kuiper Observatory—all moving down toward the Southern Hemisphere.

Nature helped us out on this particular one. We got ready with the vitality package, and nature provided on February 24, a super nova—the first one near our galaxy in almost 400 years. We were in the right place at the right time for that one.

This will partially fill the hiatus in the space science program. We will, however, be continuing our efforts on the Hubble Space Telescope, and that will be the first observatory launched in the new space shuttle manifest. I think it is scheduled for 1988.

It also continues the development of the Gamma Ray Observatory, another great observatory; the Magellan mission to Venus, and as I mentioned, the Galileo, and the other planetary missions.

It includes $25 million for the initiation of a new start, but it is part of an International Solar-Terrestrial Program called the Global Geoscience Space [GGS] Mission. It consists of two satellites measuring the solar emissions influenced by the magnetic field of the Earth.

SPACE RESEARCH AND TECHNOLOGY

The Space Research and Technology Program has been augmented by $70 million in what we call civil space technology initiative, the CSTI. This is an attempt to regain some of the momentum that we lost in the technology area. We find ourselves losing ground to the Europeans and to the Soviet Union in space technology and this is an attempt to begin to catch up, although it by no means provides everything that we need in this regard.

As was mentioned, we will continue with the development of technology for the National Aero-Space Plane, and I imagine there will be questions about that, but our role in that plane is primarily technology, which includes the lightweight thermal structures, high-speed propulsion, and development of the computational tools, the National Aerodynamic Simulator, just dedicated a month ago at the Ames Research Laboratory.

SPACE TRACKING AND DATA SYSTEMS

The request for space tracking and data systems will provide for the transition of a ground-based tracking network which we have had in the past, to the so-called tracking and data relay satellite [TDRSS], so that all of our tracking of satellites can be done from space rather than from overseas stations.

INSTITUTIONAL AREA

In the institutional area, we are augmenting our work force by 625 civil servants. This is partly in response to the Rogers Commissions' recommendations that we need to strengthen headquarters, but also strengthen the reliability, safety and quality assurance throughout NASA.

DR. FLETCHER'S CLOSING REMARKS

In closing, I think in spite of all our differences, Mr. Chairman, this subcommittee has supported NASA over the years in a way that we hope we deserve. We are dedicated to the proposition of earning your support in the years to come.

We think it is important to make America proud of what we do, to maintain our leadership in both aeronautics and space. The American people deserve and expect no less, and with your help, we will do it. That concludes my informal remarks, Mr. Chairman.

[The statement follows:]

STATEMENT OF DR. JAMES C. FLETCHER

Mr. Chairman and Members of the Subcommittee:

I am pleased to appear before you to present President Reagan's FY 1988 budget request for NASA. Before I turn to the budget request I would like to give a brief update on our activities to recover from the Challenger accident.

Last year when I accepted the Rogers Commission report on the Challenger accident, I pledged to take whatever actions necessary to make NASA a better organized, better managed, more competent, safer agency, thereby restoring the excellence that has been its hallmark for nearly three decades.

Today, I am pleased to report that NASA is well on the road toward realizing those goals and we have turned the corner in our efforts to recover from the Challenger accident. Gradually, we are getting the space program back on track. Difficult though this past year has been, it also has been a year of rebuilding, and a year of strengthened resolve to return the Nation to the forefront of space activities, safely and reliably. We have moved steadily forward to realize that goal.

We have stabilized our programs and improved the way we manage the Space Shuttle and Space Station programs. We have accomplished a comprehensive NASA management reorganization based on recommendations from the Phillips Committee. This is one more step in strengthening both our technical and institutional base. We are preparing in a careful and orderly way for the resumption of Shuttle flights in February 1988, and for the initiation of the developmental phase of the Space Station during FY 1987. We are continuing our Space Science and Applications and other programs so vital to the expansion of human knowledge. We are focusing renewed effort on building the technology base for greater accomplishments in space in the future. And we are further strengthening the technology upon which our leadership in space depends.

The FY 1988 budget request for NASA provides for a balanced space program even though conceived in an environment of considerable fiscal restraint. NASA's proposed budget meets the highest priority needs identified during the budget formulation process and provides an effective base for development of a full program to assure United States leadership in space. It reflects the President's strong and continuing commitment to space and aeronautics programs and to achieving a permanently manned presence in space with a Space Station in low Earth orbit. The President has requested a NASA budget totalling $9.481 billion. NASA's FY 1988 request includes $3.623 billion for Research and Development, $4.064 billion for Space Flight, Control, and Data Communications, $195.5 million for Construction of Facilities, and $1.598 billion for Research and Program Management.

In FY 1988, we will continue to give top priority to returning the Shuttle to flight status. The budget request provides $3.7 billion for the Space Transportation System. Activities as part of the Shuttle Production and Operational Capability Program will concentrate upon continued correction of the defects which have been found in the solid rocket booster and the weaknesses in other elements of the system and on testing the modified systems to assure that they can be safely flown. Also included is further implementation of the recommendations of the Rogers Commission to enhance our ability to sustain a safe and effective operation of the Shuttle. These activities are well underway.

We are working toward a schedule that would permit the next Shuttle flight in February 1988, if at that time we are ready to commit to a safe flight. This schedule is tight and, of course, subject to adjustment based on progress in the test program. Production of an orbiter to replace the Challenger will be in progress using the full funding appropriated in FY 1987. The budget request also provides for the continued lay-in of orbiter spares and replacement of structural spares used in the production of the new orbiter. Space Transportation Operations funding supports a FY 1988 launch schedule of four flights, with nine flights planned for FY 1989, and ten flights planned for FY 1990.

The Space Transportation Capability Development effort reflects an increase in Spacelab operations to accommodate planned return-to-flight activities, and an increase in funding to continue hardware design and development of the Orbital Maneuvering Vehicle (OMV). IUS, TOS, and PAM upper stages will be procured to support major U.S. planetary missions, and for deployment of the remaining TDRS satellites. Payload operations funding will provide support for the Hubble Space Telescope, Galileo, Ulysses, Magellan, the Astro mission, and TDRS. The Advanced Programs effort will support system concept definition and key advanced technology in, among other things, crew systems, geostationary Earth orbital unmanned platforms, reusable Orbital Transfer Vehicles, future tethered systems applications, second generation shuttles, and joint NASA/DOD studies on future launch vehicles.

NASA's Office of Space Flight, at my direction, is nearing completion of an analysis of the role of expendable launch vehicles as a complementary launch capability to the Shuttle to assure future U.S. access to space. The findings of the "mixed fleet study" at this time, are that expendable launch vehicles could provide a viable and necessary augmentation in the overall launch capabilities of the U.S. Government. However, no final policy determination has been made as to the number or types of vehicles which might be sought for NASA missions, and no funding is included in the FY 1988 budget to accommodate a mixed fleet program. We are examining priorities and options for incorporating this concept within the funding envelope proposed in the FY 1988 budget.

NASA's Safety, Reliability, Maintainability and Quality Assurance (SRM&QA) Program has been consolidated and expanded under a new Associate Administrator, with an FY 1988 budget request of $16.2 million. Additional funding is planned, in part, to revitalize NASA's basic safety program and to create an agencywide systems assurance function which, among other things, will provide a capability for problem reporting, corrective action and trend analysis. The broad data base provided by this system will generate information to be used for design, flight and test reviews, and will be accessible by NASA and its contractors on an iterative basis. Its trend analysis capability will provide early and more complete illumination of problems for senior management. Major new initiatives are also underway in risk management policies and assessments, advanced non-destructive evaluation techniques, Failure Modes and Effects Analysis/Critical Items List/Hazards Analysis, and flight and ground operational safety. Other objectives include prescribing evaluation factors to be included in solicitations of competitive proposals which clearly establish the relative importance assigned to the quality of the services provided; enhancement of contract provisions and incentive-award-fee criteria for SRM&QA; and consolidation of SRM&QA functions at various NASA Centers.

The Administration continues to place a high priority on the development of a permanently manned Space Station, and NASA's FY 1988 budget request of $767 million for Space Station supports substantial and steady progress in meeting the President's goal of an operational capability in the mid 1990s. The Space Station is essential to regaining a position of leadership in space for the United States. Its practical benefits will be many -- it will be an orbiting laboratory for the conduct of science, the development of new technologies, and the stimulation of commercial enterprises. It could provide a facility in space to service and repair spacecraft. It could function as a transportation depot from which spacecraft can depart to geosynchronous orbit and beyond. The lessons learned from operating the Space Station in the 1990s -- in life sciences, microgravity sciences, technology, and assembly of large structures -- are necessary prerequisites to any future long-duration manned exploratory mission.

Leadership values of the Space Station, however, may exceed its considerable practicality. It represents the commitment of the United States to a future in space. This future will be intellectually rigorous, technically demanding, and commercially profitable. With the positive response to President Reagan's invitation to friends and allies of the United States to participate in the program, the Station symbolizes our Nation's desire to cooperate with others in mutually beneficial civil space activities. With the Soviet Union already operating two orbiting stations, the Space Station symbolizes the intent of the United States to be second to none in utilizing the diverse capabilities of a permanent human presence in space. Perhaps most importantly, as we steadfastly recover from the loss of Challenger and her crew, the Space Station symbolizes our national determination to remain undeterred by the tragedy and to continue to explore the frontiers of space.

The Space Station Program itself, in the past six months, has made substantial progress, and I am confident we are now on the right track. We have completed an extensive, 21-month definition and preliminary design study, supplemented by a critical evaluation of the Station's configuration conducted by a special NASA task force. We have completed a three-year effort in technology development, extensively examined operational factors, and restructured the Program's management. In response to Congressional directives, we have baselined a man-tended capability early in the assembly process, provided for the accommodation of early payloads, and initiated a flight telerobotic servicer program. We have also studied the related subjects of Space Station safety and crew rescue, involved the user communities in design activities and made progress in the international negotiations which will define the Space Station partnership during hardware development and operations.

We have recently completed an in-depth review of the configuration and cost of the Space Station. We now estimate that the baseline configuration of last fall would cost approximately $13 billion in FY 1984 dollars compared to the original estimate of $8 billion. In addition, we estimate that we would need to augment the basic engineering and technical support activities at the NASA Centers by about $1.5 billion over the next eight years to support the Space Station.

The President, on April 3, authorized us to proceed with the design and development of the Space Station, with the goal of establishing permanent United States human presence in space by the mid-1990's. Because of the increase in the development cost of the planned configuration, however, we plan to proceed now to request proposals from industry for a phased development program. The first phase, now the "revised baseline progrm," will provide an initial permanent human presence in space by early 1996 with significant capabilities for scientific activities, especially in the microgravity and life sciences, and will accommodate international involvement. We estimate the cost of this revised baseline program to be $10.9 billion (in FY 1984 dollars). In addition, we estimate that we will need to augment the basic engineering and technical support at the NASA Centers by about $1.3 billion (in FY 1984 dollars) over the next eight years. Funding requirements for FY 1988-1990 will not change from those accompanying the President's budget.

Information developed from the industry proposals, along with results of an independent review of the full range of alternatives for the Space Station configuration and related costs, will provide data for a decision this fall on any changes to the revised baseline's configuration, cost and funding profile. The result of all these activities will be a sound Space Station configuration, a solid understanding of design issues and level of funding that will enable NASA to undertake a successful development program.

In Space Science and Applications, NASA's budget continues to develop major projects to study the Earth, the solar system and the universe. Although the Challenger accident has delayed the launch of many scientific missions, their importance to science and to the expansion of human knowledge remains unquestioned, and they will be launched as expeditiously as possible, consistent with our capabilities. We are pursuing a strategy to carry the Space Science and Applications program through the hiatus in Space Shuttle flights so that we can continue the first class science which has been the hallmark of NASA.

Because of the diminished frequency of Shuttle launches, particularly in the early years of resumed flight, we are carefully considering the options for recovery of the Planetary Program. We will launch each mission as soon as practically possible consistent with vehicle availability. The FY 1988 request of $1508.3 million will provide necessary support to accommodate replanning of major flight projects and smaller payloads under the revised Shuttle manifest. It will maintain our critical research base which will provide for exploitation of already operating missions as well as analysis of data from previous missions. The FY 1988 request also supports efforts to prepare for the Space Station era which is expected to increase the potential for scientific advances many fold; the initiation of the funding in this budget will prepare NASA to make maximum use of the Space Station.

The FY 1988 budget supports a viable program of science across the various disciplines, with many international partners. It provides for continued effort on the Hubble Space Telescope, scheduled for launch from the Shuttle in 1988; the telescope will enlarge the volume of the universe viewed by 350 times and will extend our vision back ten billion years, almost to the birth of the universe. It also supports continued development of other major projects, including the Gamma Ray Observatory; the Magellan mission to Venus; the Galileo mission to Jupiter; the TOPEX ocean circulation satellite approved last year; the Upper Atmosphere Research Satellite and the Ulysses Solar Observatory. The Cosmic Background Explorer, which will study the radiation from the birth of the universe, is scheduled for launch in 1989 from Vandenberg Air Force Base on a Delta rocket, which will enable launch of this most important scientific spacecraft only nine months later than planned prior to the Challenger accident.

This budget also provides for the resumption of Spacelab missions in early 1989.

We have conducted an extensive review and program planning activity addressing all of our options for restoring the solar system exploration program. Unfortunately, we can provide only three planetary launch opportunities with the Shuttle in the 1989-1990 timeframe. We will use these opportunities to launch our three most advanced missions: Magellan, Ulysses and Galileo. The Mars Observer, which is in an early state of development, has launch windows in August 1990 and in September 1992. Therefore, we have retained our 1992 Shuttle baseline launch date for the Mars Observer Mission. A decision was recently reached to launch Galileo in October/November 1989 timeframe and Ulysses in October 1990.

The budget includes $25 million for initiation of the Global Geospace Science Mission, which will support the full participation of the United States in the International Solar Terrestrial Physics (ISTP) program, an important cooperative effort with the European Space Agency and Japan. The program will involve the launch of a series of spacecraft beginning in 1992 and operating through the decade, to study the basic physics of the Earth's magnetosphere and solar terrestrial relationships. The program will accomplish the most comprehensive study of the Earth's magnetosphere ever attempted and will increase our understanding of how incoming energy from the Sun is distributed, stored and released.

The FY 1988 budget does not include funding for the Advanced Communications Technology Satellite (ACTS), consistent with the Administration's effort to avoid possible competition with the private sector and to minimize Government subsidies for activities more appropriately and effectively undertaken by the private sector.

In Commercial Programs, the FY 1988 budget supports a greater emphasis on promoting commercial ground-based activities, through existing outreach initiatives such as the Technology Utilization program. The use of NASA-developed technology will aid non-aerospace companies by familiarizing them with the opportunities for future commercial space involvement. At the same time, it will assist both aerospace and non-aerospace companies already interested in space-based commercial development in future flight-related projects. The program will support additional Centers for Commercial Development of Space (CCDS), which conduct high technology research aimed at the development of new products and processes having either commercial potential or contributing to new commercial ventures in space. We plan to also initiate a sounding rocket program to provide companies opportunities for brief weightless experiment time for projects with commercial potential during the Shuttle downtime and possibly thereafter.

In recent years, considerable concern has been expressed in Congress and elsewhere that this Nation may be, in effect, mortgaging its future in space by living off past technological achievements. In order to continue to ensure United States leadership in space technology, ongoing technology efforts in NASA's FY 1988 Space Research and Technology Program have been augmented by $70 million as part of a new Civil Space Technology Initiative (CSTI). The CSTI will begin a major new effort to strengthen the Nation's technical base and thereby its competitive posture, as well as to rebuild and restore NASA's technical strength. The program will be implemented in close cooperation with industry and with expanded university involvement. It includes research in technologies for safe and efficient access to space, for Earth-orbiting operations, and for supporting science. In transportation, launch vehicle propulsion research will be aimed at reusable, high-performance engines for next-generation vehicles, a new booster technology program will develop options for both liquid rocket hybrid and propulsion systems, and an aerobraking flight experiment will demonstrate use of the atmosphere to slow a vehicle returning to Earth orbit at high velocities. Earth-orbiting operations capability will be enhanced through a continued and expanded effort in automation and robotics. Applications include autonomous systems for control of multiple subsystems in the Space Station; launch system software to replace routine, labor-intensive activities; robotics for remote assembly, repair and servicing of space vehicles; and high capacity power delivery. Supporting technology for science will include efforts in structures research, sensor research for Earth observations and astrophysics, and data research for onboard processing for large data-demanding systems. CSTI is an important first step in sustaining United States industrial competitiveness and leadership in space.

Our program of Aeronautics Research and Technology is focusing on emerging technologies aimed at maintaining U.S. leadership in aviation and enhancing U.S. industrial competitiveness. The FY 1988 NASA request for this program is $375 million. During the past year, the X-29 forward-swept wing completed the initial flight envelope expansion; industry began flight tests of the GE/NASA Unducted Fan engine; and significant progress was made in joint research with the Federal Aviation Administration addressing wind shear and collision avoidance systems. This year, flight testing will begin on an advanced high-speed turboprop and the X-wing research aircraft. In FY 1988, emphasis on our computational research will lead to advances in the design of aircraft and propulsion systems with the new Numerical Aerodynamic Simulation capability that is now on line at the Ames Research Center. Also, promising results are expected in research aimed at highly maneuverable aircraft technology and high-temperature composite engine materials -- materials that promise revolutionary advances in engine thrust-to-weight ratio and efficient supersonic cruise propulsion systems. In the still higher speed regime, we will continue with the development of technology for hypersonic and transatmospheric flight in support of the National Aero-Space Plane program. Particular emphasis is on lightweight thermal structures, high-speed propulsion, and development of the computational tools necessary for vehicle design and integration.

The FY 1988 request of $967 million for Space Tracking and Data Systems will provide for the continuation of the vital tracking, command, telemetry, communications, data relay and data processing support to meet NASA's flight program, as well as advanced systems requirements. The transition from a ground-based tracking network to a space-based tracking capability for low Earth orbital missions, which began with the TDRS-1, is continuing. The next two Tracking and Data Relay Satellites are scheduled for launch when Shuttle operations resume in February and September 1988. TDRSS will be considered operational when three fully functioning spacecraft are in geosynchronous orbit, and the spacecraft and ground terminal have completed their individual and systems acceptance tests.

The proposed FY 1988 Construction of Facilities program will continue to preserve and enhance NASA's facilities so as to maintain our research, development and testing capability and effectiveness. This budget includes key pacing facility requirements for Space Station development, essential institutional requirements for R&D, testing, and operational support, and the initial increment of an program to assure environmental compliance. The nurturing and strengthening of our facilities base is a fundamental prerequisite in NASA's continuing contribution to the Nation's overall technical competitveness.

In the institutional area, we will be taking two major steps in FY 1988: continuing implementation of the organizational changes we announced on January 9, and increasing the NASA civil service ceiling. The revised NASA organization reflects the results of the eight-month management study headed by General Phillips, under the auspices of the National Academy of Public Administration, that made an objective and comprehensive assessment of NASA's management practices and their overall effectiveness. The study's recommendations are designed to improve management of our technical programs, institution and human resources. The actions we have taken and will be taking to implement the changes recommended will strengthen our organization, enable us to focus more clearly on our goals and objectives and achieve what we set out to do more efficiently and more effectively.

The increase in our civil service ceiling of 625 workyears will bring our complement to 22,425 full-time equivalents. The 625 workyears will provide the increased staffing needed to implement the recommendations of review groups, including the Rogers Commission. The added people will be used in the areas of safety, reliability, quality assurance, program direction, and technical support, as well as to meet resource requirements of the Office of the Inspector General.

The funds associated with the additional civil service ceiling are in NASA's FY 1988 Research and Program Management request. The balance of the funds requested in R&PM will cover a continuation of current levels of support to our centers and programs at anticipated price levels. This includes the research, test, operational and facility support and related goods and services necessary to operate efficiently the NASA installations, as well as the travel funds critical to the effective management and oversight of NASA programs. Funding of the NASA institution at the requested level is critical to providing the manpower and support needed for accomplishing NASA's space and aeronautics activities.

In closing, I would like to state that the high level of support NASA has received from this Subcommittee, in particular, over the past year, has been invaluable in the successful implementation of our recovery program. NASA is very grateful for that support, and for the support it has received from the Congress as a whole as well as from the American people. Today, more than ever, NASA is determined to be worthy of that support. With renewed dedication to excellence, we will strive to make America proud and to maintain our leadership in aeronautics and space. The American people deserve and expect no less.

Mr. Chairman, this completes my prepared statement. I would be pleased to respond to questions you and other Members of the Subcommittee may have.

SPACE STATION—DOD USE FOR NATIONAL SECURITY PURPOSES

Senator PROXMIRE. Thank you, Dr. Fletcher, and thank you especially for doing such a fine job in a limited time.

We are going to confine questions in this round to 5 minutes for each Senator, so that everyone can get at least some questions.

Dr. Fletcher, today I was sent a copy of a letter from Secretary of Defense Weinberger to Secretary of State Shultz, dated April 7.

In the letter, Secretary Weinberger made it clear that the station will be used by DOD for national security purposes. He also warns against paying too high a price for international cooperation.

Specifically, here is what he says:

> We will have paid too high a price if we fail explicitly to reserve the right to conduct national security activities on the U.S. elements of the space station without the approval or review of other nations.

This might be a stumbling block with other nations coming in and sharing the costs.

My question for you, sir, is, do you agree with that letter of Secretary Weinberger?

Dr. FLETCHER. We did receive a copy informally of that letter, and it is simply a letter from the Secretary of Defense to the Secretary of State, presenting the Defense Department's position on this.

Our position at NASA is that we will follow whatever the national priorities are, but at the moment, we have always indicated that the Defense Department would be allowed to use the space station. It is a national space station with international partners, and that has always been a part of the negotiations with the Europeans.

We don't think that there is a fundamental difference, but there is a perceived difference by our partners that the Defense Department might want to "take over the space station." That is part of the negotiations that are underway and this is one of the aspects—I think it would be up to Secretary Shultz to respond.

Senator PROXMIRE. What is your reaction to the statement by the Secretary of Defense that we will have paid too high a price for participation by other countries if we submit action by the Defense Department for their approval or review?

Dr. FLETCHER. I don't think that it is part of our plan, to submit for our international partners approval or review any Defense research that is planned to go aboard the space station. They have never asked for that approval or review. They, I think, are entitled to know if and why the Defense Department plans to use it. So far we have had no request whatsoever from the Defense Department to use the space station. We are just keeping those options open.

Senator PROXMIRE. Well, this is notice that they certainly have every intention of doing so.

Dr. FLETCHER. I think this is only keeping their options open. I don't think there has ever been a specific request to do so.

DOD'S USE OF THE SPACE STATION

Senator **Proxmire**. Well, here is what he says in another section:

> We have already initiated conceptual studies of possible DOD uses of the space station. We will formulate plans for DOD use as the program matures.

That is his plan, and I just wanted to make sure that we had on the record the attitude of your agency as well as the attitude of the Defense Department. I think we have that now.

DEVELOPMENT PHASE OF THE SPACE STATION

Dr. Fletcher, in your April 3 letter to me and the accompanying revised space station program plan, you discussed the phased development approach and also mentioned an independent technical and cost review which will examine a full range of cost alternatives. The review will be carried out under the auspices of the National Research Council [NRC] and will be due at OMB by September. However, we are hoping to go forward with requests for proposals for the development phase of the station this spring.

Can you tell us how you plan to proceed if you receive a series of proposals in response to your RFP that are based on a plan that the group looking at cost alternatives finds inappropriate? To put it another way, don't you risk wasting time and money if you proceed with RFP's on the basis of a space station plan that could be changed after the review process, or is the review process simply a formality?

Dr. **Fletcher**. Mr. Chairman, I am going to ask Dale Myers to respond to that, but let me just give you the preamble to those negotiations.

We have plans to put in the request for proposals options for the possible alternatives that we can visualize. So basically, we will have proposals on a number of possible ways of going in the RFP. We also have the option of negotiating anything that might come out of the NRC study into the final contracts.

We don't plan to negotiate the contract until the NRC study is finished. It is not an idle, perfunctory study. We fully anticipate that those studies will not reveal anything so startling that we cannot accommodate it, if it makes sense, into the contracts that we will negotiate.

Senator **Proxmire**. Thank you so much. My time is up. Senator Garn.

BLOCK ONE/BLOCK TWO DECISION

Senator **Garn**. Thank you, Mr. Chairman.

Dr. Fletcher, referring to the space station proposal and the most recent decision to go with Block One and Block Two, is it true that NASA would prefer to go with a full-up space station and that this decision was primarily driven by the bean counters down at OMB?

Dr. **Fletcher**. It was driven by budget considerations, Senator Garn. Quite frankly, as you mentioned, we have a severe budget deficit, and the White House is not unaware of that deficit. Their feeling was that we ought to at least confine our expenditures in the next 3 years or so to what we had originally projected.

In order to fit that runout, we felt that we should pull back on the full space station. However, having said that, if the opportunity arises, even in fiscal year 1989, we can still build the full space station without any loss of momentum because the parts that were deferred until fiscal year 1989 or 1990.

Now, Mr. Myers may want to correct me on that.

Mr. MYERS. Senator Garn, the whole program is set up to be able to phase the program. The planning that we have done does deal with going with this Block One program first. In order to keep the overall funding down, the 1991 budget is the place where we would incrementally add the phase 2 elements that would make up the full space station. But those elements can be started in any year that would lead to the full space station capability.

Senator GARN. I understand that, and rather than putting you further on the spot, understanding all of us know how OMB works in many areas besides space. Budget considerations are important, but I think the subcommittee should understand what has been done.

Because of the increase in estimated cost of the space station, without dealing with capabilities or future space policy, OMB has decided that we have to stay within this for political and budget reasons. So it has been divided into Block One and Block Two.

Block Two is primarily the science arms, top and bottom, so to speak, and the science community will not be happy if that is not built, and I would not be happy either. I think that anyone who looks at it would determine that we need a full-up space station in order to achieve the scientific experiments and things we wish to do with it.

Congress ought to be aware of what has just been said, although for budget constraints, it is being presented in that format, and a phase situation; that the RFPs will be designed so that if Congress decided to look more to the future rather than just today, as OMB is looking, that we are not producing those decisions because the money would not be spent in any event; they are 2 or 3 or 4 years down the road.

I just want to make the point for the record now that I think we would be very foolish if we do not do that as we go along and decide that it is penny-wise and pound-foolish to build part of a space station and not have the full capabilities of that station.

So we play smoke and mirrors with budgets in every area; we do it every year. We are essentially doing it here, and if we think we are saving money by saying, "Well we will do Block Two sometime down the road, or we may not do it at all," I think we are kidding ourselves. As long as we recognize the reality of the game that OMB is playing and forcing NASA to play, that is fine with me.

But I personally will be pushing for a full-up space station as those decision times come along, to try to get us to recognize the reality of the situation and I think penny-wise and pound-foolish is an accurate description. It is the old three-quarters of a loaf, and in this case it is not the best way to go. If we are going to have a space station, it ought to be a full-up space station and ought to have the scientific components.

A couple of years ago, when Jim Beggs was still Administrator, I put a hold on some money as chairman of the Appropriations subcommittee because I thought NASA was going too far in the direction of just—gee whiz, we got a space station and we have men and women up there—and not doing enough with the scientific end and the robotics, and held up money while they did an additional study to have a better balance between man and the robotics end and the scientific end.

We certainly should not be abandoning the scientific end. Don't anyone misunderstand me, that is not NASA's intent. I can speak, at least for what I think the reaction would be, without putting them on the spot, that they would prefer a full-up station and we go ahead as rapidly as we can.

This has been dictated by the bean counters at OMB, again, and we ought to be doing with a full-up space station so that it gets all of the capabilities and the productivity out of it that we can.

But, again, it is phased, and they have drafted the proposals and the RFP's, Mr. Chairman, so that these things can be taken into consideration as we go along, and they will have the different estimates so that we will know exactly where we are going and Congress will be able to make those decisions as the years pass without regard to OMB.

HEAVY-LIFT LAUNCH CAPABILITY

One other problem I have been concerned about in the whole area of the space station is the total reliance upon the shuttle because of the number of dedicated flights it takes. A couple of years ago I tried very hard to get NASA and the Air Force to get together on heavy-lift capability, in excess of 50,000 pounds. I was not able to do that at all.

I pushed for shuttle-derived technology feeling that—I am not talking about a shuttle, I am not talking about the current SRB's or SRM's, I am talking about derived from that technology rather than a completely new heavy-launch vehicle.

There are a lot of people I think who are coming around to thinking that way. We did nothing about it. There does not seem to be a great deal of coordination between NASA and the Air Force because the Air Force wants to build their own space force, I guess, with Buck Rogers, and doesn't prefer to cooperate as well with NASA as I think they should.

But I happen to think that when we used to talk about doing 24 flights a year on a space station on 4 shuttles per year, that was not possible—we really needed 5. Certainly we needed four, but even with that, what is taking place between NASA and the Air Force is the attempt to develop a heavy-lift capability as a complement of the shuttle and to provide a means of putting up space station parts with a lot less flights if you have that heavy-lift capability.

Dr. Fletcher. I would like to address both points. On the business of the phasing, we would not be asking for additional money in fiscal year 1988 to have the full space station. We could do that with the money we are asking for. But it is important to get that amount of money in fiscal year 1988 that we have asked for, in order to keep open our options for doing the whole space station if we decide to do so in fiscal year 1990 or 1991.

With regard to heavy-lift launch vehicle, I think Senator Garn's point is well taken. There is no question but that NASA needs a heavy-lift launch vehicle. We do have a budget constraint, and we are working with the problems. We are trying to work a way which allow us to assemble more efficiently a space station using a shuttle-derived vehicle, which should not be too expensive, but nevertheless there is up front money required. In addition to that, which is equally important, Senator Garn, we must accommodate all of the other payloads that should be off-loaded from the shuttle so that it can be properly used for dealing with the people-transportation to and from the space station.

But both of those are under study at NASA at the present time.

SPACE SCIENCE

Senator PROXMIRE. Senator Grassley.

Senator GRASSLEY. Thank you, Mr. Chairman. Dr. Fletcher, my first question will be in regard to analysis of some budgeting to NASA. The opinion was by Dr. James Van Allen of the University of Iowa, published about a year ago in the Des Moines Register and the New York Times, and I am going to submit the entire statement for the record, and then ask for a more fully written response—more so than the thing I want you to focus on now, which deals just with budget matters.

He, in his statement, offered nearly all of the important scientific results in space have resulted from the use of unmanned satellite and spacecraft. Yet more than two-thirds of NASA's budget is devoted to the development and operation of space shuttle fleet and to the huge, permanently manned space station."

He questions such a distribution of emphasis and that is the thing that I would like to have you respond to me today because of the budget considerations that this Subcommittee has.

[The information follows:]

BUDGET REQUEST FOR SPACE SHUTTLE AND SPACE STATION

	NOA in millions fiscal year 1988	Percentage of total budget
Shuttle production and operations capability	$1,230	13
Shuttle operations	1,886	20
Subtotal shuttle	3,116	33
Space station	767	8
Total	3,883	41

The percentage of funding in the STS and the space station budget request for fiscal year 1988 is considerably less than that cited by Dr. Van Allen even though funds are included in the space shuttle budget to comply with the Roger's Commission report and to correct anomalies prior to return to flight. We have maintained a level of funding for space science and applications of approximately 20 percent of our total R&D and SFC&DC budget over the last 15 years. The shuttle and space station offer opportunities for the advancement of space science that otherwise would not be available. In addition, while pursuing the goals of assuring a safe and effective space shuttle and a permanent presence in space, we have succeeded in establishing and maintaining a healthy space science and applications program.

SCIENTIFIC MISSIONS ON SPACE STATION

Dr. FLETCHER. Senator Grassley, Jim Van Allen is an old associate of ours and is talking about science return, particularly in his own discipline. As you know, he is an expert in the analysis of the so-called ionizing layer around the Earth. So from his point of view, a good many of the scientific achievements have been made with satellites, unmanned satellites.

There are many other missions, however, besides physics and radiation belts, that can only be done with the space shuttle. The best example, or maybe the one that should be emphasized, is the one that Senator Garn referred to. You can do man-tended missions, space processing we call it, materials processing, in no other way except on a shuttle or on a space station and the spacelabs were specifically designed to do that.

That is not Professor Van Allen's field of course, but it is extremely important both from the point of view of what we call micro-gravity science, and also potential commercial and medical benefits, which as Senator Garn mentioned cannot be dealt with in either a scientific manner or in a cost benefit manner.

In addition to that, we have many other scientific missions that can be done in no other way. For example, the observatory that I mentioned earlier, the space telescope, and then following, almost fully funded, the Gamma Ray Observatory—these are permanent observatories in space and they have to be maintained just like an observatory on Earth.

There is no other way to do that except by having manned flights deal with those observatories. You could go on and on. There are a lot of missions advertised, Mr. Chairman, by us earlier, but maybe not emphasized that can only be done by the space shuttle, and that is why we continue.

Having said that, we have always maintained a fairly important fixed proportion of our budget for space science, and Professor Van Allen is very much aware of that. He would like to make the portion larger, but it is an average of between 20 and 25 percent of our total R&D budget, and we have always managed to keep it that way—not every year, because basically there are ups and downs depending on the particular mission—but we have, I think it can be said safely, we have the best space science program in the whole world in this country.

We have lost leadership in the manned space program, as has been indicated in the press and so forth, but in space science we are second to no other country in the world and it is partly because of the space shuttle and partly because of our emphasis on space science.

Senator GRASSLEY. I will study your response to the entire article.

Senator Proxmire. I might say, Senator Grassley, that we hope to have Mr. Van Allen testify before the Committee on May 1.

Senator Grassley. If that does materialize, let me know ahead of time.

INTERNATIONAL COOPERATION ON THE SPACE STATION

In your statement, or your testimony, you state plans for a space station that will cost at least $10.9 billion, plus $1.3 billion in fiscal year 1984 dollars during the next 8 years. You also state that the space station will accommodate international involvement.

Will any of our international partners in any way help pay for the construction and support of the space station?

Dr. Fletcher. Yes, indeed, Senator Grassley. The Europeans, under an organization known as the European Space Agency [ESA], are contributing something on the order of $2 billion of that money, and that was their old estimate. That probably has to be updated along with our update of the cost.

This was to build several things: one is an attached laboratory, particularly dedicated to microgravity science and to life science, which is an important thing you can do in a space station.

They will also contribute what they call a man-tended free flyer. That is a free-flying platform, unmanned, but like the space telescope it will be resupplied by the space station to support primarily microgravity experiments that can be done with very, very small interference with people or animals.

In addition to that, they plan to furnish an orbiting platform that we call the polar orbiting platform, as a part of the space station program. That is the Europeans.

In addition to that, the Japanese will furnish another module which is partly pressurized for people and partly an observatory. Canadians are also participating.

The total investment for the three international partners in last year's estimate was $3 billion. This compares to our original estimate of $8 billion. I imagine they will have to go through a costing exercise much as we have, and in the final analysis it may be a larger fraction. However, we will have access to their modules. In addition, the Canadians will build a remote manipulator, as they did for the shuttle, at their own expense, to help us assemble the space station. Therefore, we shall have access to their capability.

Senator Grassley. Since my time is up, would you submit in writing just some sort of analysis from the original thought process of what our government thought other governments should pay? Their response, and then how the final negotiation was arranged?

Dr. Fletcher. We will be glad to do that, Senator Grassley.

[The information follows:]

INTERNATIONAL COOPERATION IN THE SPACE STATION

When then-Administrator James M. Beggs visited the summit nations in March 1984 to extend the President's invitation to cooperate in the space station, he proposed to Europe, Japan, and Canada that they invest in the space station a percentage of their space budgets comparable to the U.S. percentage. Therefore, he suggested that Europe invest $2 billion, Japan $1 billion, and Canada $200 to $300 million. Each of the partners accepted the President's invitation and, indeed, began to plan their space station program on the basis of these figures. NASA and its counterpart agencies then initiated detailed discussions on what elements they would provide to the space station, culminating in agreements in the past year on what those elements would be. During this time, each of our partners have readjusted their estimates, and are now going through detailed cost reviews on these elements similar to what NASA has just undertaken. Therefore, we expect these cost estimates to be revised.

SPACE STATION BUDGET REQUEST

Senator PROXMIRE. Senator Nickles.

Senator NICKLES. Thank you, Mr. Chairman.

Dr. Fletcher, when we talk about the space station, how much are we talking about as far as the fiscal year 1988 budget is concerned?

Dr. FLETCHER. $767 million.

Senator NICKLES. We have heard the figure $10.9 or $11 billion, and I think you just mentioned that a year ago the estimate was $8 billion. So it has gone from $8 billion to $11 billion?

Dr. FLETCHER. Approximately, Senator Nickles.

Senator NICKLES. Does that include all phases, both phases?

Dr. FLETCHER. That only includes Block One, Senator Nickles. The $10.9 plus the $1.3 billion, which was not included in the $8 billion, is for only Block One. To complete the entire space station, the $10.9 would be more like $13 billion and then you would have to add DTMO, or ground support, of another $1.5 billion, so the total would be more like $14.5 billion if we built the whole space station.

Senator NICKLES. But when you are talking about the $10.9 billion, you are talking about Block One?

Dr. FLETCHER. Yes.

Senator NICKLES. That would be over what period of time?

Dr. FLETCHER. Starting this year, fiscal year 1987 through 1996.

Senator NICKLES. So you are looking basically at spreading that cost over about 9 years.

Dr. FLETCHER. Approximately, yes.

Senator NICKLES. So, starting at $700 million, and you will soon be on close to $1 billion for the balance of that time.

Dr. FLETCHER. Yes, we can supply the runout for the record, Senator Nickles, if you would like.

[The information follows:]

DEVELOPMENT PHASE OF THE SPACE STATION

The development of the first phase of the space station is estimated to cost $10.861 billion in fiscal year 1984 dollars. In addition to this, we will have to add an additional $1.339 billion (fiscal year 1984 dollars) to fund increased laboratory and technical support. The phasing of these funds is as follows:

[Dollars fiscal year 1984 in millions]

	Development	Laboratory and technical support
1987	82	50
1988	505	109
1989	1,195	205
1990	1,195	205
1991	1,640	221
1992	1,690	174
1993	1,759	173
1994	1,524	116
1995	829	51
1996	442	35
Total	10,861	1,339

Senator NICKLES. I was just looking at your appropriations, and also your authority and outlays.

Dr. FLETCHER. Senator Nickles, could I interrupt? Those are all in 1984 dollars. You have to escalate those to 1988 dollars, and then who knows what inflation is going to be in the outyears. We can't estimate inflation, but those numbers I gave you were all in 1984 dollars. The $10.9 would be something like 13 percent higher if you used fiscal 1988 dollars.

BUDGET FOR THE REPLACEMENT ORBITER

Senator NICKLES. Let me ask you. There was budget authority throughout the early 1980's, around $7 billion and then gradually increased, $7.8 billion in 1986. In 1987, it went up to $10.5 billion; was that for replacement of the shuttle?

Dr. FLETCHER. It included about $2.1 billion for the replacement orbiter and that is the main reason it went up; yes, Senator.

Senator NICKLES. That will give us how many orbiters?

Dr. FLETCHER. Four orbiters total, but one of those, the *Columbia*, does not have the same capability as the other three. It was the first one.

SOVIETS' SPACE STATION

Senator NICKLES. When you are talking about space stations, is it correct that the Soviets have a space station in orbit today?

Dr. FLETCHER. Senator Nickles, the Soviets have had a permanent space station since about 1972 called the Salyut which did not have anywhere near the capability of our Skylab. For example, Skylab was launched in 1973, and it didn't have the capability to grow in capacity.

A little over 12 months ago, the Soviets came up with a second version of the space station called the MIR. MIR has a lot more capability than the old Salyut. It has at least four ports around one end—perhaps five if you count the docking port. These ports allow for adding onto the MIR space station.

So in principle, they could do with the MIR what we are planning to do with our advanced space station.

Now last week, they apparently attempted to add one observatory to one of those docking modules, and it didn't work for some reason. But nevertheless, the capability exists.

We have some concern that by the time we get to our space station they will have progressed to a similar point with their MIR. By adding to that capability with their various ports, there is the potential for the MIR to be as advanced as the U.S. space station or even more so. So there is some urgency to get on with our own space station.

MILITARY PURPOSES OF THE SOVIETS' SPACE STATION

Senator NICKLES. Do we have an estimate of what percentage of their research, either in their entire space program or their space station, that is used for military purposes?

Dr. FLETCHER. Unfortunately, the military is all mixed in with the civilian space program in the Soviet Union. We at NASA have never been able to separate out the civilian portion of it, and we have asked for help in this regard.

Think of it this way, Senator Nickles, all of the launching vehicles, the Proton and so forth that puts people up there, the MIR and their Salyut, they are all military vehicles and so that is all part of the military budget.

Their Salyut was a military space station, basically; very little civilian use. The MIR is moving toward civilian use, particularly because they have invited some scientists to participate in their work. That could be partially supported, but I suspect even that is almost entirely military; just the instruments will be civilian. So, basically, we don't know how to separate out the civilian portion of it.

I think it is important to note that the way they have gone about it is not by fits and starts, like we do in this country. We have a big flurry about the space shuttle, and that lasted for a while, and then we have a big flurry about the space station and that lasts for a while.

When they have a failure, like they had about a month ago, on the Proton that failed, 12 days later they had another Proton up without this fancy review and a 2-year standdown. I have just been told that the difficulty with their astrophysics laboratory that occurred about 2 weeks ago, has been corrected and apparently they were successful yesterday.

They don't have this big up and down program that we have here. So their main asset is the steady improvement in their space capability which we don't seem to have.

Senator NICKLES. Thank you, very much.

Senator PROXMIRE. Thank you, Senator Nickles. Senator Johnston.

USE OF HEAVY-LIFT LAUNCH VEHICLES

Senator Johnston. Thank you, Mr. Chairman.

Dr. Fletcher, I am very pleased that the Administration has finally got the space station on line, even though in a somewhat truncated manner. As far as I am concerned, a great nation can't be timid on every frontier of science, certainly space, so I am glad we are going in this direction.

Now, you have a Block One with $10.9 billion. As I understand from an excellent briefing by Mr. Stofan the other day, this Block One is to the shuttle, not to use the heavy-lift launch vehicle. So, therefore, there are no dollars in that $10.9 billion to finance the heavy-lift launch vehicle; is that correct?

Dr. FLETCHER. That is correct, Senator Johnston. I think it would be appropriate if Mr. Myers addressed the question of the shuttle-derived launch vehicle. He is involved in that activity and has a special study ongoing. I would like him to comment on that.

Mr. MYERS. Senator Johnston, since the initial announcement by the Defense Department of their interest in the heavy-lift launch vehicle, we combined forces with them in developing the needs and requirements that might be involved for a national heavy-lift launch capability.

We used as a basis a joint study that had been ongoing for 2 years with the military called the space transportation architectural study [STAS]. That program showed that there were real opportunities to reduce the launch cost to space by taking advantage of the technologies that we have developed over the years.

Senator Johnston. I understand that, but I have a limited time. Let me ask you this: Your present plans don't call for the use of the heavy-lift launch vehicle to deploy the space station.

Mr. MYERS. We have studied the use of the heavy-lift launch vehicle for deployment of the space station and there are advantages in it. We are continuing those studies.

Senator JOHNSTON. There is, as a matter of fact, no need as presently projected to lift a cargo as high as 100,000 to 150,000 pounds, is there?

Mr. MYERS. There are no direct needs at the moment. We can make advantages in planetary missions by having a heavy-lift launch vehicle, in terms of time of transit to the planets.

Senator JOHNSTON. I am speaking of the space station.

Mr. MYERS. We could make major reductions in the number of shuttle launches required to assemble the space station, if we had a heavy-lift launch vehicle.

BUDGET FOR HEAVY-LIFT LAUNCH VEHICLE

Senator JOHNSTON. If I may ask, Mr. Stofan, didn't I understand as of the other day—I guess that was before Secretary Aldridge's letter of February 19 matriculated through the system—but didn't I understand that the heavy-lift launch vehicle was not in NASA's plans? Are we going to have to add to this $10.9 billion the cost of the heavy-lift launch vehicle?

Dr. FLETCHER. Senator Johnston, we have to distinguish between plans and budget. It is not in the fiscal year 1988 budget. I am not sure that it will be, even if an amendment were possible, but it is definitely in our plans. It is in our plans for the two reasons that were given. It would ease the assembly of the space station—I am not sure it would save money, but it would ease the assembly—and it is also necessary for anything we want to do beyond the space station.

Senator JOHNSTON. I am speaking of the space station itself. How much are your budget costs going to have to go up to accommodate the heavy-lift launch vehicle?

Mr. MYERS. It really isn't related to the present plans for assembly of the space station. We plan to assemble the space station with the shuttle.

Senator JOHNSTON. It is unrelated to the space station?

Dr. FLETCHER. That is correct.

Mr. MYERS. From a budget standpoint, yes.

Senator Johnston. I mean, there may be some needs in the future for planetary exploration and for other things and it may be a useful national thing for the government to do, but it is not part of the space station Block One or Block Two.

Dr. FLETCHER. That is correct; not from a budget standpoint.

Mr. MYERS. If a heavy-lift launch vehicle existed, we would be very interested in using it to assemble the space station.

HEAVY-LIFT LAUNCH REQUIREMENTS

Senator JOHNSTON. Let me ask, Mr. Stofan, what loads do you have that you need 150,000 pound lift; do you have requirements for that in the space station?

Mr. STOFAN. At the present time, the space station is designed to be launched totally by the shuttle because it is the only transportation system that exists that we can use.

We have studied how you would use a heavy lift, but there is not one. We continue these studies in case a heavy-lift vehicle becomes available which we could use to assemble the space station. I think it looks especially promising if we go Block One-Block Two; that is, it could be very useful in putting up Block Two, and that is more in the timeframe when a heavy lift could be used.

But if it came earlier, we would go back, and we are carrying on studies, and we probably would use it in Block One. But since it doesn't exist, I can't plan to use it.

Senator JOHNSTON. It is not part of your plan and not part of your need, except that if it existed and were cost effective, you would be able to utilize it?.

Mr. Stofan. We think we would be able to use it.

Senator GARN. Would the Senator yield?

Senator JOHNSTON. Yes.

NEED FOR HEAVY-LIFT CAPABILITY

Senator GARN. For a comment—the answers, again, are correct. It is not part of the plan, but there are some of us for some time, for 2 or 3 years, have been trying to get a heavy-lift capability because what you are talking about, with the shuttle is what, 30 to 32 dedicated shuttle launches to put up all the pieces of the space station. You talk about 12 launches a year and 4 orbiters. I mean, it is a rather inefficient way to put up the space station. Whereas, if you have the heavy-lift capability, you could do it with a lot fewer launches and not dedicate so much of the shuttle just to putting up an orbiter.

Now what we are getting into is some people don't want a heavy-lift capability because of SDI. Let's put SDI out of the picture. At least in this Senator's opinion, there is an overwhelming need, and has been for some time, for the development of a heavy-lift capability for civilian purposes in general, but specifically, as a much more efficient and faster way to put a space station into orbit, rather than using 30 to 32 dedicated shuttle missions a year with 4 orbiters, when they are planning a flight rate of 12 a year.

Senator JOHNSTON. I don't argue with that, but what I would argue with is saddling the space station with the cost of the heavy-lift launch vehicle, and thereby weighing down the space station so that we can't afford it. I think people over at SDI would like to hide some of their money in NASA.

Senator Garn. There is another way to do it. Like we funded the fourth orbiter, you get it out of DOD's hide. It is a lot easier to find $2 billion for a fourth orbiter out of $300 billion DOD than it is out of $7.5 billion from NASA. I agree with you, budgetarywise.

SENATOR MIKULSKI'S REMARKS

Senator PROXMIRE. Senator Mikulski.

Senator MIKULSKI. Thank you, very much, Mr. Chairman.

Dr. Fletcher, I am pleased to be here this morning with you. As you know, Maryland is the home of a great deal of first-class space activity, whether it is the NASA Center at Goddard, or whether it is the ground station for the Space Telescope at Johns Hopkins University. But NASA is more than an important force in the Maryland economy. You are at the center of America's struggle to regain our competitive edge.

I know you are under a great deal of pressure from getting the shuttle flying again safely, to funding the space station under enormous fiscal constraints, and to guarantee space science does not become displaced by hardware. I am sympathetic with those pressures and want to work with you.

RESUMING SHUTTLE FLIGHT STATUS

My first round of questions is really related to getting the shuttle flying safely and on time. My questions will go to some of the recommendations in the Rogers Commission report.

I know that NASA has announced a launch date of February 1988. I received an excellent briefing from NASA officials that I am appreciative of.

I want the shuttle to fly, but I am concerned that politics and PR might, again, be dominant over science, safety, and sensibility. We want you to launch when you feel that you can do it safely, which then takes me to the flight rate recommendations and the Rogers Commission.

As you know better than I—I am sure you have gone over it with a great deal of meticulousness. They raise the issue about your flight rates and about how you decide that these flight rates be done. Could you comment on the reasonability of the date of February 1988, and also what you are doing to make sure that your flight rate is based on science, safety, and sensibility, and not on politics and PR?

Dr. FLETCHER. Senator Mikulski, I will start the answer, but I expect Admiral Truly will want to continue.

The February 28 date is an internal date. We have to set some sort of a target in order to give everybody a marching date. There are a lot of threats to that target, and we are not going to launch in February, March, or April until we have cleaned up all of the things that need to be cleaned up before we fly.

That is underway now and there are quite a large number of threats to that date; things that could happen to cause that date to slip. But I want to assure you of one thing: there will be no political pressure from anybody causing that date to go forward or backward. It will be done entirely on the basis of whether we are ready to fly.

FLIGHT RATE

Now on the other point, the flight rate, that is a different consideration. I think we are going to be more conservative than even our most conservative efforts, that Chairman Proxmire mentioned earlier.

In terms of our flight rate initially, we may not even be able to make the flight rate that we projected out in the later years. We are busily looking at what would be required if we met that flight rate—what would we do if we did not make that flight rate, because we have to be prepared for the worst case.

So we have a mixed fleet study, which deals with the problem of a possible reduction in the shuttle flight rate. Would you like to hear from Admiral Truly, Senator Mikulski?

Senator MIKULSKI. I also want to go on, besides flight rates. I think what we are all saying is that NASA has to have a flight rate that is consistent with its resources. That is the policy that we want to see carried out.

ASTRONAUTS INVOLVED IN MANAGEMENT

In addition to that, there were several other things in the Rogers Commission report related to management. One was the recommendation that astronauts continue to be involved in management. The Rogers Commission observes that there appeared to be a departure from the philosophy of the 1960's and 1970's, when you used astronauts in management positions and recommended that NASA encourage the transition of qualified astronauts into the added management positions, and made other recommendations.

Of course, I believe that the people who actually are astronauts are some of the best advisors to you and also to some of the oversight. Could you talk about how you are involving, in addition to Senators Garn and Glenn and Congressman Nelson, the astronauts that you are using in policy?

Dr. FLETCHER. Senator Mikulski, we are using astronauts in two different ways. One is in direct-line management sense, and Admiral Truly here is a good example of that. He, I think, has flown twice, and also Captain Crippen, who has flown four times. Both are in direct-line management. We also have astronauts that are on temporary assignment throughout the agency—we have Dr. Sally Ride advising me on what programs we ought to be looking at in the 1995 and beyond period; we had the commander of the next shuttle flight, Rich Hauck, helping me with the Public Affairs and Congressional Affairs Program, but unfortunately, he got picked for the first flight, so we had to let him go.

We are using them both in an advisory capacity and in a management capacity. They are good people—I don't want to say everyone is as good as everyone else, but they are a select group of people and we plan to use them.

SPACE FLIGHT SAFETY PANEL

Senator MIKULSKI. My last question on the Rogers Commission report; they also recommended that you have a shuttle safety panel, as well as reorganize yourselves in terms of establishing an Office of Safety, Reliability and Quality Assurance. Could you indicate to us how that has progressed?

Dr. FLETCHER. Senator Mikulski, we do have a Space Flight Safety Panel. Bryan O'Connor, a current astronaut, is the chairman.

Senator MIKULSKI. The office of?

Dr. FLETCHER. The Space Flight Safety Panel is in the Office of Space Flight.

Senator MIKULSKI. My time is up, but you have modeled yourself off of what the Rogers Commission recommended; is that right? It was for safety, reliability and quality assurance throughout the agency.

Dr. FLETCHER. Yes, we have accepted all of the Rogers Commission's recommendations. We have put the safety office in the program office, as was suggested. We also mentioned the Associate Administrator for Safety, Reliability, Maintainability, and Quality Assurance reporting directly to me, Senator Mikulski.

Senator MIKULSKI. Thank you, and thank you, Mr. Chairman.

SCIENTIFIC UTILIZATION OF THE SPACE STATION

Senator PROXMIRE. Dr. Fletcher, as you know, the Chairman of your Task Force on the Scientific Utilization of the Space Station has stated that the currently conceived space station "will not satisfy the immediate needs of space science and technology users."

He thinks the current planned station will be too late, perhaps too costly, and may force important reductions upon space science and technology programs. He believes that a large, well-appointed space station that appears on the scene in 1995 to 1996 won't be nearly as important as smaller, more flexible elements put into operation earlier.

I am sure you disagree with Professor Banks. Can you tell us why?

Dr. FLETCHER. Mr. Chairman, I don't disagree with Professor Banks. Basically, what he is telling us is that he and his colleagues that were involved in the microgravity and materials processing area, have a lack of flight opportunities. What he is saying basically is that we ought to put more of those opportunities onto the space shuttle. We ought to devote more space shuttle flights to the so-called Spacelab, which we are trying to do.

He is also suggesting that if it is possible, we ought to move the space station up earlier, or some version of the space station up earlier. We would like very much to do that, but nobody has been able to figure out a way to do that. His proposal was to use the shuttle-derived vehicle to assemble the space station somewhat earlier. We have looked at that, and so far we haven't been able to see how we can do it earlier. We don't disagree.

Senator PROXMIRE. You have talked with him about the possibility of applying this notion of more flexible elements by some other means, and you just can't find it?

Dr. FLETCHER. I don't think we are finished with the study, but we do think it is an important thing to find opportunities for doing what I call materials processing. His major function is using the manned facilities, the space shuttle, and the early versions of the space station for materials processing.

We think that is an important thing to do, yes.

BANKS COMMITTEE CONCERNS

Senator PROXMIRE. The members of the Banks Committee have expressed a concern that unless NASA changed both the station and the space transportation fleet, the country could lose an entire generation of space scientists. How seriously do you take that concern?

Dr. FLETCHER. Mr. Chairman, we always take those concerns seriously, but we have had a very big accident at NASA and that is a concern throughout the agency; not just scientists, but the people who had technology experiments on the space shuttle, people who are involved in the space station itself have been compromised. All of us are a little concerned about the fact that we are losing ground on what we had planned to do 1½ years ago.

USE OF SATURN ROCKETS

Senator PROXMIRE. Back in 1972, we used a single Saturn rocket to put in orbit a manned Skylab module that had approximately the same operating space as the planned station, although it was admittedly a much cruder system.

Now it appears it will take until 1994 at the earliest—that is 22 years later—before we are able to get back in that sort of operation. I really have to wonder about the direction our space program has taken and is taking when this is the apparent result.

Doesn't this bother you?

Dr. FLETCHER. Yes, it does bother me, Mr. Chairman. What happened, if you recall, is that we were launching the remaining Saturn V's—this is the large rocket that put 250,000 pounds into low Earth orbit—by the way, before I arrived on the scene—the decision was made to discontinue that production. It was a rather costly machine.

It was about $250 million per launch, the estimated cost, and it was decided that we could no longer afford that expensive a machine. But we had enough Saturn V's left over to do both the Skylab, which was a first-class science mission and was the grandfather of all these microgravity science experiments that we are talking about now. The first experiments were done on the Skylab.

We also, on a smaller version of the Saturn, the Saturn IB, were able to carry out the Apollo Soyez Program, but those production lines have closed. We have left before us a lesser capability in terms of payload lift capability, with greater capability in terms of sustained flights, and also lower costs, I might add, than the Saturn V, and that is what we are dealing with. It would not be sensible to start up the Saturn production line again.

Senator PROXMIRE. Dr. Fletcher, unfortunately, I have to go to the floor. I am going to ask Senator Mikulski to chair in my absence, if she could. Is that possible, Senator Mikulski?

Dr. Fletcher will be back tomorrow for further questions, and we are looking forward to that, but I do have to leave now. If you can't, then Senator Garn can chair.

Senator MIKULSKI. Certainly Senator Garn is qualified. I will be happy to chair until noon. Would you then recommend that we stand in recess?

Senator PROXMIRE. That is entirely up to the committee. If the Senators want to stay and question today; that is fine. As I say, we will be here tomorrow and Dr. Fletcher and his team will be here, and there will be further questioning at that time.

GARN'S COMMENTS ON FLIGHT RATE

Senator MIKULSKI [presiding]. I think, Senator Garn, you wanted to move on to your second round of questioning?

Senator GARN. Yes; thank you. Just a brief comment. I don't have any more questions at this time, but, Senator Mikulski, you asked some questions about flight rate, and let me just make a comment. I certainly would agree with the nature of your questions and what the Administrator answered about not flying before we are ready and satisfied. Certainly no one would disagree with that.

However, I do think it is important to note at least in this Senator's opinion, we have taken longer than necessary to fly again, and I think that politics and PR played something on that side, as well. What we fail to recognize, particularly with all the incredible press coverage after the accident, is that we flew 55 manned flights without an accident, and considering the hostility of space and technological difficulties of flying returnable spacecraft, I think that is an absolutely remarkable record.

No one felt worse about the loss of those seven lives than I did, because they were my friends. It wasn't just a national tragedy, it was a personal tragedy. Mike Smith, the pilot of *Challenger*, was my trainer, and I lived with the man virtually every day for 3 or 4 months, with him taking me by the hand and being my mother hen.

On the other hand, we have placed such emphasis, at least in the press, about safety. I wonder if we had spent as much time talking about the 20,000 drunk drivers that have killed on the highways, that we might have saved 5,000, 8,000, 10,000 lives a year. All I am saying is that we need to keep it in perspective.

We should not fly until we are satisfied we can do it as safely as possible, but on the other hand, you can't guarantee safety in space. Believe me, having been there, it is impossible.

There have been no draftees on the space shuttle. Everyone who has gone is one who has fought and clawed and chewed in every way they could to get on board, and no matter how careful we are—and John Glenn has made this comment many times in meetings that I have been in with him—that no matter how careful we are or how long we wait, we will kill somebody in space in the future.

I don't see anyway to avoid that. You don't have to be too bright, when you sit on that 4.2 million pounds of fuel on launch morning and close the side hatch door and salute, and everybody, including the rescue crews, go 3½ miles away; that gives you some indication that this is different than driving down the street in an automobile.

I just wanted to not disagree with either one of you because I don't. I would just like to try to place it in the perspective, that we have a national asset there, and incredible science to learn in the future and benefit for all of mankind—every man, woman and child on the face of this Earth.

Since my opening remarks, I have been looking at a booklet of all of the programmable pumps and medical things that we have gained from this. So I hope that we do it without PR, without politics, either delaying or hurrying up the flight; that it cuts both ways, but we also recognize that we cannot guarantee safety in space, any more than I can guarantee my safety getting home on the GW Parkway tonight.

Senator MIKULSKI. I think the gentleman's standard is awfully high.

Senator GARN. That is what I was going to say. I think I would rather take my chances in space without fixing the SRB's, than the GW Parkway going home at rush hour.

Thank you, Madam Chairman.

Senator MIKULSKI. I just want to assure the Senator that my own line of questions was in no way meant to inhibit or delay our policy.

Senator GARN. I didn't take it that way.

Senator MIKULSKI. Certainly not. I think the Rogers Commission made an outstanding contribution to evaluating our space program and I just wanted to guarantee we were following its recommendations.

GODDARD SPACE FLIGHT CENTER

I do have a few questions in terms of the space station, if I may, and some are related particularly to Goddard in Maryland. Could you share with me, Dr. Fletcher, how the revised plan for the space station will affect work at the Goddard Space Flight Center over the next 4 years, particularly in terms of personnel or contractor-based work?

Dr. FLETCHER. Senator Mikulski, we don't see any impact at all at the Goddard Space Flight Center. The space station does plan to have significant amount of science, even before the permanent manned capability that is the end goal of Block One. There will be, for example, an attached payload probably on the second or third flight of the space shuttle.

That is a science-oriented payload, looking out into the heavens, attached to that horizontal beam that was described earlier and that will be a Goddard responsibility.

We also expect, along with the space station, the capability of man tending some of the observatories that are now planned by the Goddard Space Flight Center—planned but not yet funded. Of course, the space telescope is already funded, and that will be launched on the shuttle.

The Gamma Ray Observatory, as I mentioned, is already funded, but the next one, the Advanced X-Ray Facility, is also a Goddard program and very likely will be tended by the space station. In addition to that, we have the polar platforms which are still part of the plan.

Those are all Goddard programs. The polar platform is not yet funded either, but that is part of our overall space station plan.

SPACE STATION TECHNICAL HEADQUARTERS

Senator MIKULSKI. I was disappointed that you did not select Maryland for the location of the space station's technical headquarters. I believe it is called the A-prime headquarters. Could you tell me what were the final criterion you used in making this selection and how the criteria were weighted?

Dr. FLETCHER. Senator Mikulski, I would like to defer that to Mr. Stofan, but I think it should be pointed out that that was a decision made by the Jet Propulsion Laboratory, who is our principal contractor on this program. They are going to supervise the facility to begin with. They will be a major part of what we call the system support staff.

So they made the decision and they simply informed us as to the site.

Mr. Stofan, do you want to comment further?

Mr. STOFAN. Yes; I think the set of criteria was worked up by NASA, by my office and Tom Moser's office, and it is a couple of pages of criteria that were worked up for location requirements, office space, ability to put computers in, commuting—a lot of things and we can supply for the record exactly what criteria was used by JPL for the selection. They looked at over 60 sites and got it down to about 5 or 6 and then made their final selection.

I will supply for the record the detailed set of criteria that was developed.

[The information follows:]

Space Station Level A Prime Site

1. The requirements for the Space Station Level A Prime site were provided JPL by NASA. Prior to JPL initiating the source selection process, they were jointly refined, resulting in the below listed requirements.

   I. Location

      A. The facility shall be within 45 minutes of NASA Headquarters at midday either by road or metro.

      B. The facility shall be within 30 minutes of a major airport and economical hotel/motel accommodations.

      C. The facility shall be in a development area that provides a high probability of the subsequent acquisition of up to 250,000 square feet of additional space for related activities.

      D. The facility shall be in an area not requiring unusual measures for the protection of property and personnel, both at work and while in transit.

      E. The facility shall be within a 30 minute commute of a varied supply of affordable housing.

      F. The facility shall be near by food service facilities.

   II. Building

      A. The facility shall encompass approximately 110,000 square feet of contiguous rentable area.

         1. Approximately 12,000 square feet of the area will be developed for computers and similar activities.

         2. The balance of the area will be developed as offices and related activities.

      B. The computer area shall be served with adequate cooling capacity to accommodate a load of 20 watts/square foot and have an Uninterruptable Power Supply (UPS) of approximately 100 kva.

      C. The office areas shall include cooling, power and communications services to support the extensive use of personal computers, dataphones and similar electronic equipment.

      D. The facility shall include a minimum of 300 parking spaces.

E. Access to the facility shall be controlled by no more than two points.

F. The facility shall be at a current state of completion that will allow initial occupancy by June 1, 1987.

G. The facility shall be fully fire sprinklered and further protected by a smoke detection and manual fire alarm system.

H. The facility shall be designed and constructed to accommodate a minimum supported (including partitions) live load of 100 pounds/square feet of floor area.

III. General

The setting, appearance and quality of the facility shall be of a level that will attract, retain and support a professional workforce.

2. Based upon the above requirements, JPL developed the below listed evaluation criteria which were used in JPL's selection of the Space Station Level A Prime site. These criteria were not weighted as the comparative method of evaluation was used in this acquisition:

A. Suitability of Facility
B. Suitability of Location
C. Availability
D. Cost

QUESTIONS SUBMITTED BY SENATOR PROXMIRE

NASA Inspector General

Question: You have asked for $7,949,000 to support Inspector General activities in 1988. This is an increase of almost one-third over the current increase. Normally, I look favorably on increasing Inspector General budgets because such increases should save more than they cost. However, rarely are increases this large. Would you please explain the basis for a 33 percent increase?

Answer: The Office of Inspector General's (OIG) budget request for FY 1988 is approximately 32 percent greater than the OIG's FY 1987 request. The increase is associated with the 25 additional staff members requested in FY 1987 by the Administrator and supported in the President's budget. Approximately 90 percent of the 32 percent budget increase is in Personnel and Related Costs such as Salaries, Civil Service Retirement Funds, Employee life insurance, Employee health insurance, FICA, etc.; 5 percent is related to travel; and 6 percent is the OIG's portion of the NASA Headquarters overhead costs.

RESOURCE REQUIREMENTS

OFFICE OF INSPECTOR GENERAL

(000 omitted)

	1987	1988	Increase
Personnel and Related Costs	$5,448	$7,161	$1,713
Travel	275	368	93
Operation of Installation	310	420	110
	$6,033	$7,949	$1,916

In accordance with the Administrator's policy, the NASA Office of Inspector General (OIG) determined that its current staffing was inadequate to sufficiently perform the statutory functions required by the Inspector General Act of 1978. Using an audit universe of 1,383 auditable entities, the Inspector General determined that an audit, investigative, and management staff of 250 FTE was needed to provide a desirable and prudent 5-year IG coverage cycle. With the current staffing, it would require approximately 15 years to provide 100 percent coverage. With the additional 25 FTE in FY 1988, the Inspector General plans to increase the coverage of NASA operational, functional, and administrative areas from 31 percent to 38 percent. Specific areas already identified include procurement systems, ADP systems and operations, major programs and projects, and NASA subcontractors and small contracts not audited by the Defense Contract Audit Agency.

Golden Fleece Special

Question: I understand that Robert Brown of the Johnson Space Center has been funding a project wherein brain waves are used to control lights. Apparently, the user places a small helmet on the head and then concentrates on turning a light on and off. The cost of this research is reported to be $450,000. Remembering that NASA's charter does not include this sort of basic research, I have to wonder why you are paying for this. It sounds more like something the National Science Foundation might work on. Can you explain this project, and how it furthers NASA's mission?

Can you tell us which of your program funds this research?

Answer: The referenced research is sponsored by the NASA Lyndon B. Johnson Space Center (JSC) and performed under contract by Analytics, Incorporated, Willow Grove, PA. funds for this research were provided out of NASA's Small Business Innovation Research (SBIR) Program.

The subject JSC research project titled "Development and Experimentation of an Eye/Brain/Task (EBT) Testbed" is the second phase of a promising research activity. It is based on the results of a Phase I research project titled "Magnetoencephalography for Real-Time Computer Control." The results of Phase I indicated that there is a significant and robust linkage between eye movement and brain wave activity which might be interpreted as functional control signal inputs for computer-controlled devices. In Phase II, it is anticipated that components of such brain wave activity may be analyzed and used as appropriate control signal inputs for certain complex tasks without the physical intervention of the operator.

NASA is interested in conducting research on the development of brain wave activity signal input for control purposes because of the potential for achieving significant reductions in human reaction time, and for more efficient task accomplishment. These benefits could be extremely valuable to NASA in the areas of extravehicular activity in space where physical movement requires significant energy, aircraft safety, pilot flight control, and management of certain Space Station activities. The same technology also has significant potential for certain aspects of air traffic control and for many military applications. These and, of course, many other potential applications are the responsibilities of other federal organizations and numerous nonaerospace and commercial activities as well. Potential applications in the private sector include support of the severely handicapped to control prosthetic and other devices and aid to dyslexic persons.

While this field of research may indeed be of interest to and suitable for the National Science Foundation to pursue, as you suggest, we feel it is also within the scope of the NASA-legislated responsibilities for aeronautics and space research and technology. This field of research is also of interest to and suitable for many other federal agencies and departments to pursue. It should be noted that because of the many organizational interests which overlap, all agencies and departments with SBIR Programs coordinate their award selections closely to avoid any undesirable duplications of research or inappropriate awards in their SBIR Programs.

The SBIR Program was established by congressional mandate in 1982, through Public Law 97-219, to further the development of small, high-technology businesses to benefit both the Federal Government R&D activities and to increase the technological strength of the country. Congress was concerned that the technology base of the United States was eroding and they, furthermore, recognized that while innovative ideas are quite often generated and developed by small businesses, small business participation in federal R&D was disproportionately low. The SBIR Program was designed as one means of attempting to correct these deficiencies.

It was realized from the onset of the SBIR Program that innovative new concepts, by their very nature, may involve high technical risks. Accordingly, a three-phase SBIR Program was designed to provide high visibility for incremental accomplishments so that large sums of money need not be committed for research objectives without significant evidence of feasibility and progress toward stated research objectives as the work proceeds. Thus, any research project could be terminated or discontinued in the event that the proposed innovation or achievement of research objectives should prove to be unfeasible or insufficiently attractive to warrant further pursuit.

The nature of the SBIR Program limits the research it may fund. Phase I feasibility demonstrations will normally not exceed $50,000 and 6-month contracts, while Phase II projects (which are continuations of the most promising Phase I activities) normally do not exceed 2-year performance periods with funding not more than $500,000. Phase III is intended to be funded by the private sector wherever feasible (particularly for those projects having significant commercial potential), or else through non-SBIR funding by a federal agency or department when the resulting Phase II products or processes are sufficiently valuable to the government to warrant further development or end-product procurement for its own use.

As with all research we conduct and technology we develop to achieve space and aeronautics objectives, we are eager to recognize opportunities for important spinoff and technology utilization in nonaerospace applications.

Environmental Observations -- GGS

Question: You are proposing to initiate the development of a Global Geospace Science (GGS) program in fiscal year 1988 at a cost of $25 million. Can you tell us what the total cost of the program will be in real year dollars?

Answer: The Office of Space Science and Applications is presently estimating a cost of $390-$440 million for GGS spacecraft, instruments, ground systems and operations. Launches will be provided by the Office of Space Flight. Tracking, data acquisition and communications will be provided by the Office of Space Operations.

Question: You indicate in your opening statement, Dr. Fletcher, that GGS will allow the United States to become a full partner in the International Solar Terrestrial Physics (ISTP) program. Is there any foreign commitment to fund part of the GGS program?

Answer: Foreign investigators were chosen through the Announcement of Opportunity process. These investigators (mostly

European) will provide about 25 percent of the scientific instrumentation on the Wind and Polar spacecraft (approximately $25 million) and will provide correlated group observations using the Canadian CANOPUS facility and the UK Halley Bay station in Antarctica on the usual no-exchange-of-funds basis. To complete the set of multiple space flight missions exploring different regions of geospace needed to accomplish the GGS objectives in 1992-1994, agreements are being negotiated to coordinate operations of the Japanese Geotail spacecraft, the European Space Agency's Cluster spacecraft and the other satellites which might be in orbit in this timeframe. Foreign participation in the total ISTP program totals approximately $800 million.

Question: Is there any Defense Department involvement in this program?

Answer: At the present time, the Defense Department is not involved in the GGS elements covered by the fiscal year 1988 budget request. The joint DOD/NASA Combined Release and Radiation Effects Satellite (CRRES) is expected to be operating in the 1992-1994 time interval of GGS and an agreement to coordinate operations and to exchange data is under negotiation. Other possible cooperative arrangements for the WIND and POLAR missions are under informal discussion with the USAF Space Test Program, the Air Weather Service and the Air Force Geophysics Laboratory.

Question: Given the uncertainties regarding the Shuttle's flight schedule, wouldn't it be better to delay a new start such as GGS until the launch situation is clarified?

Answer: The desire to launch Wind and Polar in calendar year 1992 is driven by the following considerations: enable simultaneous coordinated measurements in key geospace regions with Geotail and CRRES based on an understanding with the Japanese that the Geotail spacecraft will also be ready for launch in March 1992, and the realization that the CRRES spacecraft will be in orbit and aging; make correlative measurements with Ulysses and the Upper Atmosphere Research Satellite (UARS) and make a significant contribution to the International Space Year. Also, the European Space Agency plans a late 1994 Ariane launch for three CLUSTER spacecraft; the use of the one CLUSTER spacecraft by NASA assumes completion of this Equatorial Science Phase in 1993-1994 before the Ariane launch. Wind, Polar and Geotail are presently manifested on the STS. However, if NASA requests and receives approval for the use of expendable launch vehicles, then the GGS launches become independent of the STS schedule.

Question: As currently conceived, the Space Station training would include some 41 elements intended to replicate as much as possible the environment expected to be found on board the Station, once it is in space. This facility will cost $156.7 million, of which $3.5 million is requested in 1988. In your justification you state that if this is not approved, adequate space cannot be provided for Space Station unique flight crew and ground controller training in time to ensure safe and effective Space Station operations. Further, you say that the first element of this facility must be completed by 1989. I am concerned as to whether you will even know what the Space Station will actually look like by the end of 1989. If the basic formulation of the Space Station is altered to a man-tended format, how long will it take you to redesign the training facility?

Answer: After two years of Space Station Definition and Preliminary Design, the work of the Critical Evaluation Task Force, and several other technical and cost reviews we are confident that we have a sound Space Station preliminary design upon which training facilities can be planned. This design satisfies the requirements of the future users and is adaptable to some adjustments in budget and requirements prioritization.

The man-tended operations capability is one milestone in the baseline assembly sequence, which can also be looked upon as a contingency plan should we need to revise the assembly schedule. Therefore no redesign would be necessary.

Our training facilities are similarly phased. Simulation of the man-tended capability will be accomplished before simulation of the completed revised baseline Station. No redesign would be necessary.

Question: In your justifications, you indicate that actual training must begin by early 1991. Since the first launch of the Space Station is not scheduled until September 1995, why must the training begin over four years earlier.

Answer: The first element launch for the Space Station is scheduled for March, 1994. Integrated simulation and training for this mission, conducted in concert with the Space Station support center, requires one year. This activity initiates actual operational use of these ground systems. Design, testing, and development of simulator systems and training for these routine simulator operations, must be completed before simulation and training can start.

Our original schedules for the development and installation of these systems required two years. An additional year was allowed for crew and ground system operator training, prior to the start of integrated simulation and training. However, based on a review of experience with the NSTS training program, as recommended by the Rogers Commission, we determined that additional training of both crew and ground system operators was necessary. Accordingly, actual training will begin approximately thirty months before first element launch with simulator readiness required thirty months prior to that, allowing for equipment and software installation and procedures development.

Question: Have you included the cost of the training facility in total Space Station cost estimates?

Answer: Costs for the facility and equipment systems are included in the NASA CoF budget for FY 1988 and the Space Station development budgets. Funds are included in the operations capability development categories respectively.

Question: If you were to build an interim man-tended Station, how would you conduct necessary training to meet an operational date earlier than 1995?

Answer: The preparation for initial assembly of either type of station would be the same. The training for a man tended approach would follow the same timelines as for the Station as proposed.

Question: You are planning to spend $196 million over five years to fund the Space Station support center. Has then figure been included in total Space Station estimates?

Answer: Costs for the facility and equipment systems are included in the NASA CoF budget for FY 1988 and the Space Station development budgets in the operations capability development categories respectively.

Question: Both the training facility and support center costs assume a 25 percent cost saving for commonality design features. Dr. Robert Myers of MITRE Corporation recently documented the conditions under which commonality leads to cost savings. Those conditions exist only where systems are small. For large systems like the ones used by the support center, it is cheaper to build two separate systems with identical functionality than one common system. This data was presented to NASA at its recent workshop on commonality. Based on this shouldn't we assume that the support center and training facility costs are underestimated by 25 percent?

Answer: There should be savings derived from commonality because the program is applying commonality in systems design on a case-by-case basis with life cycle costs a major factor. With regard to the training and simulation system and the support center system, we recognize that their intended functions are different at the top level. However, we have determined that at the subsystem or modular level, particularly within the operating systems and applications software, significant commonality can be achieved. Costs for individual development of these subsystems or modules can therefore be avoided. In addition, common spares at the modular level, and common test equipment will allow further cost avoidance.

Question: Are there similar commonality assumptions in other parts of the Space Station budget?

Answer: The program views the application of common modules, subsystems, and systems as a way of achieving significant cost avoidance: (Shared development costs, common test equipment, procedures, and spares, etc.). An example is the planned use of common data management system and communications system components in both the main base and platforms. Commonality will be applied on a case by case basis with life cycle cost considerations of paramount importance.

Question: You have asked for $690,000 as the first of a multi-year commitment for an upgrade to Mission Control Center. You retained a contractor to examine the necessity of this upgrade, and their report indicated that much of it is unwarranted. However, you are going forward with the upgrade anyway.

In light of the report, why are you going forward with the upgrade? Will you please provide me with a comparison of the study report findings and your upgrade plans?

Answer: The report referred to in the question was one prepared by the Mitre Corporation for the Johnson Space Center in August 1985, titled: "Characterization of Mission Operations Facilities." The report does not address nor assess the necessity for the facility modifications that are necessary to accommodate the upgrade and replacement of 20+ year-old equipment in the existing Mission Control Center. The equipment upgrade and replacement is an on-going program being accomplished in phases in direct support of the National Space Transportation System (Space Shuttle). The $690,000 facility modification work is required to accommodate the equipment upgrading program which will significantly improve the efficiency, capability, and reliability of the Mission Control Center System.

The subject report addresses facility floor space requirements for Space Station ground-based mission operations support and training activities. We have not been able to identify in this report or any other report, an assessment that indicated that the Mission Control Center system upgrades are unwarranted.

Question: Senator Domenici has suggested that we explore the possibility of passing a two-year appropriations bill. Would this approach create any particular problem for NASA, or do you see a benefit in having to justify your budget only once every two years?

Answer: The Adminisration is studying the subject of multi-year budgeting and whether to propose biennial budgeting for appropriations for accounts other than those in the national defense area. Biennial budgeting would appear to have substantial advantages for a number of agencies. With respect to our own agency, we provide the following comments. The uncertain nature of R&D work requires that the budget process accommodate unforeseen technical and schedule problems requiring near-term funding adjustments. These programs require several years of detailed advance study and project definition and involve continual assessment of technology readiness and competing priorities. Annual budget cycles provide the agency with the flexibility necessary to accommodate the rephasing and replanning inherent in higher technology programs.

Question: Approximately what proportion of your annual appropriation request would you consider simply repetitious of the previous year's submission?

Answer: The NASA budget is justified annually on a set of goals and objectives for programs and projects. R&D projects typically have a bell-shaped funding profile with a phased buildup as projects are initiated and a phase down period as objectives are achieved and consequently exhibit wide variation in annual budget requirements dependent on the phase.

Question: What difficulties can you foresee in preparing and submitting a two-year budget to the Congress.

Answer: Research and development projects, by their very nature, are dynamic and the two-year budget cycle would mean that estimates would be made three years or more prior to the accomplishment of the effort and has proven extremely difficult to anticipate that far in advance the technology changes and problems that will occur. A two-year appropriation, if enacted, should include provision for NASA to transfer funds between all appropriations to be able to respond to these changing needs without having to wait up to 12 months for the next appropriation/authorization cycle.

Question: Would you expect to realize any budget savings if you could plan your agency budget on a two-year basis? If so, could you estimate how much?

Answer: NASA has not identified any budget savings from a two-year appropriation.

Question: You are requesting $282.5 million for "Other Services", an increase of $23.3 million over current estimates. This is the largest increase requested under Research and Program Management with the exception of Personnel Compensation and Benefits. Please tell us what accounts for this increase?

Answer: The increase is in two parts: (1) $10.4 million for an additional 232 support contractor workyears required mainly to support increased activities as NASA returns to Space Shuttle flights; and (2) $12.9 million to cover increased contractor cost rates (5.2 percent), i.e. increased salaries and benefits for on-board employees at NASA field installations.

R&PM—Custodial Services

Question: The request includes $816,000 for custodial services which cover security guard services in the various Headquarters buildings. How many security guards will these funds support?

Answer: In the NASA Headquarters, buildings security guard services are procured through the General Services Administration. An additional minor contract provides employee badging and educational services. The $816,000 provides for a total of 29 workyears of support for both buildings security and the ancillary security activities.

Question: Tell us what kind of security problems, if any, the agency has in a given year. For example, is employee theft a problem?

Answer: NASA's agency-wide security program experiences the same difficulties that exist in other government departments and agencies implementing and monitoring security programs required by various Executive Orders mandating Personnel Security, Information Security, and Physical Security measures. In the physical security area, that portion of our missing property experience that can be attributed to theft does not indicate a serious problem of theft by NASA employees.

Question: The Office of Technology Assessment also outlined a scenario in which NASA could spend $1 billion a year and acquire within five years a permanent low earth orbit facility operating as a transportation node, an orbital maneuvering vehicle, and a reusable orbit transfer vehicle capable of transporting spacecraft to and from higher, including geostationary, orbit. The same investment over ten years could give you the initial operating capability you want.

What's wrong with this plan?

Answer: The scenario outlined by the Office of Technology Assessment is simply not possible. Developing a "space transportation center" with both an orbital maneuvering vehicle (OMV) and a reusable orbit transfer vehicle (ROTV) could not be accomplished in five years spending $1 billion a year. Nor could the "initial operating capability" be developed in a ten year period, as OTA asserts. NASA believes that the best balance between realistically developing a useful Space Station capability and holding down Federal expenditures is achieved with the Revised Baseline Configuration recently presented to the Congress.

QUESTIONS SUBMITTED BY SENATOR LAUTENBERG

ACTS--FUNDING

Question: I would like to call attention to the Advanced Communications Technology Satellite program. In the FY 1988 budget, the Administration proposed for the third time to terminate the program. The argument advanced each time has been the private sector will pick up all the funding for this program. Right now, we have in place a strong public-private partnership.

Is there any more evidence now than there was before--which is next to nothing--that the private sector would or could pick up development by itself of the ACTS technology?

Answer: There has been no specific evidence of U.S. industry willingness to fund development of ACTS technology. In 1983 there was a proposal from Hughes Aerospace to develop and demonstrate an advanced communications technology, however, it was largely discounted due to the fact that it did not include several critical technological developments central to ACTS capabilities, among them: hopping spot beam capability, space-based switching functions, and the direct detection laser transmission/reception.

ACTS-COMPETITIVENESS

Question: We are fighting to maintain our competitive edge on many fronts. The U.S. has been the world leader in satellite communications since the birth of the industry. Thousands of American jobs are at stake. The ACTS program plays the principal role in maintaining a strong base in satellite communications. Both the Europeans and Japanese are developing similar technologies which are heavily subsidized by their governments. Both groups intend to launch satellites in the early 1990's.

It is my understanding that a funding level of $84 million in FY 1988 is necessary to guarantee a fourth-quarter 1990 launch. Is this your understanding?

Answer: NASA will require $84 million FY 1988 to maintain the schedule for launch-readiness in 1990. This requirement is $14 million higher than the request submitted to OMB, which was based on a second quarter 1992 launch.

Question: Isn't it true that, if we do not meet this launch date, we will be faced with a significant increase in the cost of completing this important program?

Answer: At this phase of the program, estimates show that increases in funding will be needed to complete the program if the schedule is stretched out. Analysis shows that the most economical approach would be to continue to manage the ACTS program to a November 1990 launch readiness date.

Question: If we do not meet this launch date, our foreign competitors will be setting the standards for equipment specifications and related services. I am told that the worldwide market for hardware sales is worth billions of dollars. Don't you agree that we risk serious economic consequences if the launch slips?

Answer: Both the Japanese and Europeans are planning to launch advanced communications satellites incorporating many of the ACTS technologies. A 1990 launch of ACTS will keep the U.S. a step ahead of its competition in developing technologies for future generation communications satellites.

SPACE STATION

Question: I understand that NASA is considering a two-phase approach to Space Station development. (a) What are the benefits to the U.S. taxpayers of a phased program?

(b) What capability will a Block I Space Station provide to users? (c) What is NASA doing to assure early scientific return from Space Station?

(d) How many attached payload accommodation points are provided for users in the proposed Block I configuration? (e) Is this adequate to meet user needs?

(f) What is the rationale for having no funding for servicing in Block I? (g) Is it not possible to put some servicing capability within reasonable cost in Phase I? (h) What capability is the U.S. losing by delaying the servicing until Phase II? (i) Are we relinquishing our responsibility for servicing to the Canadians by delaying the U.S. servicing capability?

Answer: (a) The phased program would help to reaffirm U.S. leadership in space. It allows NASA to proceed with construction of the Space Station without any increase to the current budget projections for Space Station development in FY 1988-FY 1990 and without a significant change in the schedule. (b) The Revised Baseline Configuration Space Station provides for a permanent presence in space, retains international participation and provides pressurized volume, attachment points for external payloads and the polar orbiting platform. (c) The initial assembly flights will carry a limited number of payloads to assure early scientific return. (d) There are two payload accommodation points (each of which may carry several payloads) and one coarse pointing system. (e) Yes, this will meet preliminary user needs. (f/g) There is servicing capability required for the revised baseline including that for attached payloads by using the FTS system. On balance, NASA believes the capabilities of the revised baseline Station address a balanced set of requirements. In time, Station capabilities can grow and evolve to higher levels of utilization as the requirements for future enhancements evolve. (h) Without the upper and lower boom in Phase I, the servicing facility is delayed until enhanced capabilities are necessary, including three additional payload attach points. (i) The U.S. will provide servicing capability by using the FTS and manipulator systems -- with plans for a more capable servicing system in a later phase of the Station program. Phasing the Station development provides necessary capabilities early on, and we feel it is a reasonable and rational approach to maintaining maximum capabilities within appropriate fiscal constraints. There is no anticipated change in the respective servicing roles or functional responsibilities between the U.S. and Canada with respect to any Space Station servicing activities.

ROTARY ENGINE

Question: What is the status of NASA's Advanced Rotary Engine Technology Enablement Program? Given the nature of the ailing general aviation industry, and the need to keep the U.S. ahead of foreign competitors in this area, is the budget request of $0.75 million adequate? What will we get for this level of funding?

Answer: NASA's FY 1988 aeronautics program has been carefully formulated among competing priorities to address the future U.S. needs in civil and military aviation. Within the aeronautics R&T budget request of $375 million for FY 1988, the funding level for the advanced rotary engine program is approximately at $1.5 million. However, if NASA were to increase the funding level for this program by $2 million in FY 1988, two primary areas of rotary research and technology would be augmented: improved rotary combustion processes and low heat rejection methods to obtain lower specific fuel consumptions. Increasing the annual funding in these areas could allow acceleration of the program to meet technology goals in the early 1990's.

There is significant support throughout industry and the Department of Defense for an advanced rotary engine. A fuel efficient advanced technology rotary engine could be considered as an alternative to gas turbine auxiliary power units in commercial aircraft and as an alternative to current general aviation piston engines. Potential military applications, such as propulsion units for remotely piloted vehicles and marine vehicles as well as for auxiliary power units, are also under consideration.

The objective of NASA's advanced rotary engine program is to provide the technology base for a rotary engine capable of achieving a 40 percent improvement in fuel consumption as compared to conventional piston aircraft engines, a 100 percent increase in power density, and multi-fuel capability. This translates to a brake specific fuel consumption of 0.35 lb/bhp-hr (at cruise power), and a power density of 4 brake horsepower per cubic inch of displacement. The program to date has consisted of analytical efforts, both at NASA Lewis and at various universities, and a complementary experimental effort under contract with Deere and Co. The analytical work has been focused on understanding, modelling, and verifying the fundamental thermodynamic, aerodynamic, and combustion processes as an aid in minimizing fuel consumption, and structural analysis and materials research to provide lightweight components and to minimize cooling requirements.

The purpose of the contracted effort with Deere and Co. has been to design, fabricate, and test the performance of a 40 cubic inch displacement single rotor test engine by incorporating the advanced technologies developed through NASA research and at Deere. To date, the power density goal of 4 horsepower per cubic inch displacement has been demonstrated along with multi-fuel capability.

Deere and Co. will be testing lightweight rotor concepts which can be expected to result in further increases in the power density to about 5 brake horsepower per cubic inch. The program has also recently emphasized the use of high speed fuel injection technology in the experimental engine as a means of decreasing fuel consumption. A brake specific fuel consumption of 0.46 lb/bhp-hr has been obtained on the single rotor test engine using both diesel fuel and JP-4 at an rpm corresponding to general aviation aircraft cruise conditions. This is a significant fuel consumption reduction from the automotive rotary engine. Further reduction of the fuel consumption to meet the program goal of 0.35 requires a major technology advance.

The recent NASA research has shown that the fuel consumption problem is due in large part to a relatively low rate of energy release in the rotary combustion process. Thus, any augmentation which may be made in the advanced rotary engine program will be first applied to accelerating the development of an improved understanding of the rotary combustion process and the effects of related technologies such as insulated and/or catalytic combustion chamber walls. These efforts would require both analytical and experimental research efforts. Improved and possibly novel combustion systems resulting from such research efforts would then be experimentally evaluated in an appropriate test engine.

A $2 million funding augmentation could also augment the current research and technology development efforts in insulating coatings, ceramic components where appropriate, and seals and lubricants. The benefits of exhaust gas recovery to further decrease fuel consumption (via turbocompounding) for the rotary engine may also be established through experimental evaluations should further analytical evaluations predict significant improvements.

If the advanced rotary engine program as currently planned were to be augmented by $2 million per year over the next three to five years, mature technologies should be available to provide a significant increase in fuel efficiency and power density compared to current general aviation aircraft piston engines.

LETTER FROM SENATOR QUENTIN N. BURDICK ET AL.

February 20, 1987

Dr. James C. Fletcher
Administrator
National Aeronautics and Space Administration
600 Independence Avenue, S.W.
Washington, DC 20546

Dear Dr. Fletcher:

By this letter we request the submission of information, not later than March 6, 1987, regarding your agency's activities in addressing the environmental problems of the greenhouse effect, global climate change, and stratospheric ozone depletion.

The Senate Environment and Public Works Committee has held a number of hearings on the greenhouse effect, global climate change, and stratospheric ozone depletion. Testimony given at these hearings has shown that we are already committed to an unprecedented increase in surface temperature over the next few decades, with possible effects including a rise in global sea level, changes in ocean circulation, and changes in precipitation patterns.

We are deeply concerned by the prospect of such major and unparalleled changes in the composition of the atmosphere, and the implications for global climatic and environmental change. We are requesting information regarding your agency's efforts in these areas to assist us in understanding the existing and anticipated programs already addressing these issues. Specifically we would appreciate your responses to the attached questions.

We have forwarded a copy of this letter to the Chairman of the Appropriations Committee, and have requested that he incorporate these questions and your responses in the record of the budget hearings for FY88.

We look forward to receiving your response no later than March 6, 1987. If you have questions, please feel free to call Kate Kimball, Ron Cooper, Steve Shimberg, or Curtis Moore. They may be reached through the Committee on Environment and Public Works at 224-6176.

Thank you for your support in working with us on these important environmental issues.

Sincerely,

Robert T. Stafford
Quentin N. Burdick

John H. Chafee
George J. Mitchell

Dave Durenberger
Max Baucus

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1. Please describe each of your program(s) which directly or indirectly involve or support work on (a) the greenhouse effect, (b) climate change, and (c) stratospheric ozone depletion, including:
   (a) basic research efforts
   (b) effects on human health, biota, etc.
   (c) studies of policy options for avoiding, minimizing, or coping with predicted changes, including use of alternative fuels and substitute chemicals and conservation.
   (d) international programs

2. Please indicate your current agency priorities and where, among these priorities, the problems of the greenhouse effect, global climate change, and stratospheric ozone depletion appear.

3. Does your agency have a major thrust or focus with respect to greenhouse, climate change, and stratospheric ozone issues? What are the priorities within your greenhouse, climate change, and stratospheric ozone programs? Are these multi-year efforts? When do you anticipate completing each of these projects?

4. The scientific evidence demonstrates that we are already committed to a 2°C increase in global average temperature, and that the effects of global warming may be manifested as early as the next several decades. How have these findings been factored into your planning? How does the magnitude and timing of these changes affect your projects?

5. Please provide a detailed accounting on the following, including a breakdown by specific offices/laboratories and projects for each fiscal year.
   (A) For the greenhouse effect
      (1) Expenditures in FY86.
      (2) Appropriations and expected expenditures in FY87.
      (3) Budget request in FY88.

(B) For climate change
   (1) Expenditures in FY86.
   (2) Appropriations and expected expenditures in FY87.
   (3) Budget request in FY88.
(C) For stratospheric ozone depletion
   (1) Expenditures in FY86.
   (2) Appropriations and expected expenditures in FY87.
   (3) Budget request in FY88.

6. Please describe how your agency's efforts are coordinated with those of other federal agencies and the scientific community.

7. What do you see as the five highest priority research needs in the area of greenhouse effect, global climate change, and stratospheric ozone depletion?

NASA's Upper Atmosphere Research Program

Although the current NASA atmospheric chemistry and climate research programs are separate, we recognize that the ozone depletion and greenhouse warming issues are strongly coupled because changes in ozone are predicted to modify the Earth's climate, and because the same gases which are predicted to modify ozone are also predicted to produce a climate warming.

Several years ago, at the direction of Congress, NASA implemented a program of research, technology development, and monitoring of the Earth's upper atmosphere, with particular emphasis on the stratosphere where 90% of the Earth's ozone layer resides. In compliance with the Clean Air Act Amendments of 1977, Public Law 95-95, NASA biennially prepares an assessment report on the state of knowledge of the Earth's upper atmosphere, and on the content and progress of the NASA Upper Atmosphere Research Program (UARP). Since 1978 NASA has provided Congress with five assessment reports on the potential threat to atmospheric ozone from human activities. These assessments reflect the work of hundreds of atmospheric scientists and were produced after extensive discussion and analysis. The conclusions of the latest assessment report, titled "Present State of Knowledge of the Upper Atmosphere: An Assessment Report: Processes that control ozone and other climatically important trace gases," was transmitted to Congress in January 1986. The second part of the report which was also transmitted to Congress in January was titled "NASA Upper Atmosphere Research Program: Research Summaries 1984-1985." The next in these series of reports will be prepared later this year, and delivered to Congress in January 1988.

The long-term objectives of the NASA Upper Atmosphere Research Program are to perform research to:

(a) understand the chemical, dynamical, and radiative processes that control the physical structure and chemical composition of the Earth's upper atmosphere, and

(b) accurately assess possible perturbations of the upper atmosphere caused by human activities. Specifically, of greatest urgency at present is an assessment of the combined effects of continued increases in the atmospheric concentrations of carbon monoxide (CO), carbon dioxide (CO_2), methane (CH_4), nitrous oxide

(N_2O), oxides of nitrogen (NO_x), and halogen containing gases such as chlorofluorocarbons 11 and 12 (CFC_{13} and CF_2C_{12}) and methylchloroform (CH_3CC_{13}) on atmospheric ozone and the climate system.

Our knowledge of the key physical and chemical processes controlling the chemical composition and structure of the upper atmosphere has advanced significantly during the last few years. However, we must recognize that significant uncertainties in our knowledge still remain and can only be resolved by a vigorous program of research. NASA is committed to continuing its leadership role in studying the upper atmosphere and working closely with the university and non-university scientific community; other U.S. government agencies, in particular the National Oceanic and Atmospheric Administration (NOAA), the National Science Foundation (NSF), the Environmental Protection Agency (EPA), and the Federal Aviation Administration (FAA); industry, i.e. the Chemical Manufacturers Association (CMA); and other national and international scientific agencies, e.g. the World Meteorological Organization (WMO) and the United Nations Environment Program (UNEP), to resolve these outstanding uncertainties in an expeditious manner.

NASA's program is broad and comprehensive and its research activities generally fall into three general categories:

(1) Field Measurements and Technology Development:

This activity consists of studying the geographic distributions and strengths of trace gases released at the Earth's surface, measuring the solar irradiance incident on the Earth's atmosphere, determining the chemical composition and physical structure of the atmosphere using a balanced set of in-situ and remote sensing techniques, and the development of instrumentation. A wide range of instruments are currently being utilized on a variety of platforms including aircraft, balloons, rockets, space shuttle, and satellites. Ground-based observations are also performed. The principal objective of the field measurements program is to provide a description of the composition and structure of the atmosphere which can be used as a test of the theoretical models. These field and satellite programs will overcome our greatest shortcoming which is that we are presently data limited. The most important recent development in our knowledge of the chemical composition and structure of the stratosphere has been the analysis validation and release of data obtained by instruments flown on the Nimbus-7 (the Limb Infrared Monitor of the Stratosphere (LIMS), the Stratospheric and Mesospheric Sounder (SAMS), and the Solar Backscatter Ultraviolet/Total Ozone Monitoring System (SBUV/TOMS)), Applications Explorer II (AEM-2) (the Stratospheric Aerosol and Gas Experiment (SAGE), and Solar Mesospheric Explorer (SME) (visible and infrared spectrometers) satellites, and on the Space shuttle (the high resolution ATMOS infrared interferometer). This data is currently undergoing further intensive interpretation.

(2) Laboratory Studies:

Laboratory measurements are carried out to provide the basic input data for the theoretical models. These data consist primarily of chemical kinetics rate constants and photochemical cross-sections. In addition, spectroscopic data of atmospheric constituents are acquired for the interpretation of atmospheric measurements. Development of calibration standards is also a vital aspect of this program.

(3) Theoretical Studies and Data Analysis:

The two principal activities in this area of the program are the development of a hierarchy of models to describe the chemical, radiative, and dynamical processes which control the chemical composition and physical structure of the present atmosphere and to predict possible future changes, and the analysis and interpretation of large satellite data sets and other major field measurement campaigns.

Some specific thrusts in the near term include:

(1) A vigorous effort to understand the processes responsible for the recent decrease in the ozone column above the Antarctic in spring-time. This effort is strongly supported by the NSF Polar program, NOAA, and by the CMA. A campaign of ground-based field measurements, in conjunction with satellite observations, was carried out last year. Analysis of the data is currently underway. An aircraft and ground-based field measurement campaign for August 1987 is being planned.

(2) The final design and initial implementation of "A Network for the Detection of Stratospheric Change System." This system is being designed to provide the earliest possible detection of changes in the chemical composition and physical structure of the stratosphere, and the means to understand them. Successful implementation of this system will require cooperation and coordination at both the national and international level. Discussions on the implementation of this system are currently in progress. This program will be coordinated under the National Plan for Stratospheric Monitoring and has been endorsed by the UNEP scientific panel engaged in negotiation of a protocol to regulate fluorocarbons.

(3) The Upper Atmospheric Research Satellite (UARS), currently scheduled for the fourth quarter of 1991 on the Space Shuttle manifest, will provide the first simultaneous measurements of the atmospheric distributions of oxygen, hydrogen, nitrogen, and chlorine species, coupled with measurements of temperature, dynamical quantities such as winds, and energy inputs and losses. These measurements will allow us to study the coupling between the chemical, radiative, and dynamical processes which control the chemical composition and structure of the stratosphere, and, in particular, the amount and distribution of ozone, in a manner never before possible, the mechanisms responsible for atmospheric variability, and the response of the stratosphere to changes in external factors such as solar activity and natural phenomena such as volcanic eruptions.

(4) Atmospheric concentration measurements and flux measurements of biogenic gases predicted to control atmospheric ozone from representative ecosystems in order to understand past and future trends in the composition of the atmosphere. Particular emphasis is in methane, which also plays an important role as a greenhouse gas.

(5) The continued development of theoretical models which can simulate the coupling between the chemical, radiative, and dynamical processes that control the chemical composition and structure of the atmosphere.

These research activities are ongoing, multiyear efforts aimed at reducing some of the current uncertainties in our scientific understanding of these issues. We expect that progress in most areas will be steady and that many of the key uncertainties should be significantly reduced within a decade. We expect very significant progress on the issue of Antarctic ozone within a few years, but understanding the coupling between the chemical, radiative, and dynamical processes that control the chemical composition and structure of the atmosphere will require the UARS data before much more progress is made. If the "Early Detection of Change System" is implemented, then significant progress on detecting and understanding the causes of changes in stratospheric composition should be expected within a decade. But a fuller understanding of the factors which control atmospheric ozone will require a new initiative in the Earth sciences because the ozone issue is not simply a problem of understanding the atmosphere, but requires an intimate knowledge of the oceans and land. This theme will be discussed later after a discussion of the climate program.

The long-term objective of the NASA Climate Research Program is to conduct research to improve our understanding of the radiation and dynamical processes which govern the climate system of the Earth and to observe the physical properties of the system which influences its change. The unique aspect of the NASA program is its use of space technology to address these objectives. The program includes research on: establishing the long term data base required for climate studies; analyzing the data base; developing models to diagnose and describe the climate system; and developing special observing capabilities to address problems unique to climate, such as the greenhouse effect.

Understanding the basic nature of solar and Earth radiation and its transfer through the atmosphere to and from the land surfaces and oceans is one of the fundamental goals of climate research. Monitoring and analysis of the sun and components of the Earth's radiation budget and their effects on the atmosphere, land and oceans are crucial to developing this understanding. They will be used to diagnose the present (and near future) state of the climate, for the formulation of empirical prediction techniques and, ultimately, for the development and validation of global and regional climate prediction models, such as those necessary for assessing the direct and indirect consequences of the greenhouse warming. Insights gained in studying the Earth's radiation budget are also vital to developing confidence in prediction of the long-term effects of man's influences such as CO2, ozone, and aerosols, as well as the effects of natural phenomena such as volcanic eruptions.

Recognizing the importance of this research in improving our understanding of the mechanisms controlling climate variations, the National Climate Program has established a principal thrust in Solar and Earth Radiation and has assigned NASA lead agency responsibilities for organizing and conducting a long-term broad-based research program of observations and analysis. The broad nature of this activity has required close coordination with other federal agencies having overlapping programmatic interests, in particular NSF, NOAA, and DOE, as well as with the international scientific community through the World Climate Research Program.

Recent precise measurements from the NASA Solar Maximum Mission (SMM) and the Nimbus-7 Earth Radiation Budget (ERB) experiment have established that the total solar radiation flux, also known as the "solar constant," above the atmosphere is indeed variable. Since 1979, sensors on both spacecraft independently observed variations of the solar flux as large as 0.25 percent on time scales from days to weeks. The amplitude of observed monthly and yearly variations, although smaller, nevertheless have the potential for affecting climate and, as such, are high priority monitoring objectives. Additional data are now becoming available from the NASA Earth Radiation Budget Experiment (ERBE), which also confirm the observed solar flux variability. We are incorporating a similar instrument on the Upper Atmospheric Research Satellite (UARS), which will continue these measurements into the 1990's. Periodic Shuttle sortie flights are planned to verify the performance of the free-flyer measurements and to intercompare other instrument designs.

The study of the role of clouds in climate has been given a particular emphasis in NASA-sponsored climate research. Clouds have a very strong modulating influence on the radiative energy exchange between the atmosphere and the upper and lower boundaries. They control the amount of solar energy absorbed by the climate system as well as the longwave energy radiated to space. The partitioning of the solar energy input between the atmosphere and oceans is also highly dependent upon cloud cover. These effects are extremely important on climate time scales and are critical to our understanding the effects of long-term CO2 building in the atmosphere.

The first step necessary in understanding the role of clouds is to develop a climatology of the important cloud parameters over a period which reveals the diurnal, seasonal, and interannual variations. This requirement is being met through NASA's central role in the International Satellite Cloud Climatology Project (ISCCP), organized as a part of the World Climate Research Program (WCRP). The ISCCP, which began in 1983, routinely collects and processes cloud image data from the international array of operational meteorological satellites operated by the U.S., Japan, India, and the European Space Agency, to produce a five-year global cloud data set.

It is also essential to develop cloud models which incorporate the basic physical processes which contribute to the generation, maintenance and dissipation of clouds. In order to gather the data to test these cloud models, NASA, along with NSF, NOAA, and DOE, is conducting a series of field experiments in which the relevant atmospheric and cloud parameters will be measured in detail over a number of cloud formation cycles and a variety of synoptic weather conditions leading to the generation of various cloud types. This effort is a part of the First ISCCP Regional Experiment (FIRE) which began in 1986 and will continue through 1989.

Whether viewed as part of the WCRP, or as basic elements for the proposed International Geosphere/Biosphere Programs, these experiments will not only benefit oceanography and climate, but will also make fundamental contributions to Earth Science. In addition, the understanding gained from these experiments will assist in the design of future operationally oriented ocean and climate observing systems.

Two recent events have emphasized the ocean's importance in global climate: the disastrous 1982-1983 El Nino, which caused billions of dollars in damage and considerable loss of life, and a recognition of the potential harmful effects of increasing CO2 levels in the atmosphere due to the burning of fossil fuels. We now know that our ability to understand and ultimately predict the droughts and flooding associated with a severe El Nino or with the warming predicted from a CO2 increase is severely limited by a lack of ocean measurements. New global information available from satellites, coupled with data from the interior of the ocean, will meet this need. A second limitation is the lack of data on the distribution of global cloudiness. An ongoing international research project will address this deficiency.

Reports from the National Academy of Sciences and studies by various government agencies all point to the serious consequences of a global warming if such warming does occur. They also stress the need for better understanding of the problem, particularly the role of oceans and ice cover and clouds in either modulating or amplifying the warming trend. The existing climate models used for predicting carbon dioxide induced warming oversimplify interactions between the atmosphere and the ocean. Any significant improvement will require many more observations leading to a better understanding of oceanic and atmospheric behavior.

For the oceans, the crucial measurements include ocean circulation, sea surface winds and temperatures, biological productivity, and the polar ice cover. Biological productivity can be determined through measurements of ocean color, which depends primarily on the photosynthetic pigments (chlorophyll) contained in marine plants. Since these plants are the basis of the marine food web, measurements of their amount and distribution are critical to obtaining a better understanding of biological and chemical processes, including the cycling of carbon through the oceanic ecosystems.

All of these measurements should be well distributed over the globe and made regularly to determine natural variability. Such coverage can be provided only from a space-based program operating over a period of several years.

NASA plans for the decade of the 1990's include a dedicated altimeter mission for ocean currents, the Ocean Topography Experiment (TOPEX), and a color scanner (for ocean biological productivity) aboard a platform of opportunity. In order to exploit the potential offered by this next generation of oceanographic sensors, we are working with the NSF, U.S. Navy, and NOAA, as well as with our international partners to plan a set of comprehensive at-sea experiments. Two examples are the Tropical Ocean Global Atmosphere and World Ocean Circulation Experiments being organized under the World Climate Research Program (WCRP).

It is well known that climate fluctuations and trends may have effects on society--on a regional as well as on a global scale. Land observations from satellites will also become part of a data base for monitoring changes of the surface, for instance of vegetation and snow cover, and of the climate of the surface of the earth. Such monitoring is particularly urgent at the present time due to man's increasing sensitivity to climatic fluctuations and the possibility that man's activities may have climatic consequences.

Additionally, deforestation and dessertification due to poor agricultural practices could lead to changes in CO_2 and regional can cause large changes in methane production, another important gas related to global temperature changes. It is clear that global, continuous monitoring of such anthropogenically induced changes, as well as naturally occurring variations, can only be obtained from satellites.

NASA is encouraging the development of the international satellite land surface climatology project to develop methodologies for deriving quantitative information concerning land surface climatological variables from satellite observations of radiation reflected and emitted by the earth. Such quantitative information is required to:

1) Monitor global scale change of the land surface caused by climatic variations or by human activity;

2) Further develop mathematical models designed to predict or simulate climate at various time scales;

3) Permit inclusion of land surface climatological variables in diagnostic and empirical studies of climate variations.

The time is appropriate for conducting such studies because of the increasing sophistication both of remotely sensed observations from space and the development of improved climate and medium range weather prediction models.

The land surface variables of interest and potentially obtainable more or less directly from satellite observations are vegetation cover, albedo, solar radiation, longwave radiation, skin temperatures, emissivity, soil moisture, and snow cover and depth. The work may be divided into two parts in present research.

1) Evaluation of existing satellite data collected in the last fifteen years to determine their usefulness in detecting climate related fluctuations or man-induced changes in the surface of the Earth.

2) Development and validation of methods to convert satellite-observed radiances to surface climatological variables. The validation effort will require intercomparison of satellite-derived quantities with simultaneous ground- and aircraft-based measurements, to be carried out in field programs in selected areas.

The first investigators in the first part of this work, retrospective studies, were selected in response to a letter issued in January 1985. The first field experiment will be held during 1987 at the Konza Prairie Grassland in Kansas. This site is managed by Kansas State University in conjunction with the National Science Foundation.

An experiment with somewhat similar aims was conducted in France in the summer of 1986 under the auspices of the World Climate Research Program. NASA sent a C-130 aircraft equipped with various radiometers for remote sensing for a six week period during this experiment. NASA has also assembled a team of investigators from NASA, USDA, and various universities to analyze the resultant data.

The land surface climatology work being led by NASA should lead to important new insights as to the interactions between the land and the atmosphere, and thus of how the Earth functions as a global system.

In describing the type of research program needed to improve our scientific understanding of environmental issues that affect not only the United States but also the whole world, it is evident that the Earth is a planet characterized by change and has entered an era when activity may be able to alter its environment on a global scale. The ozone and greenhouse warming issues are just two of the interrelated environmental issues we face today.

To gain a scientific understanding of how human activities will affect the Earth's environment requires a new approach to Earth sciences. The scientific community believes that we need to obtain a scientific understanding of the entire earth system on a global scale by describing how its component parts and their interactions have evolved, how they function, and how they may be expected to continue to change on all time scales. In particular, the immediate challenge is to develop the capability to predict whether or not there will be changes that will occur in the next decade to century, both naturally and in response to human activity, and the magnitude of such changes. This will require a nationally and internationally coordinated program of interdisciplinary research to investigate long-term, (10-100 years), coupled physical, chemical, and biological changes in the Earth's environment recognizing that land, atmospheric, oceanic, and biospheric processes are strongly coupled on a variety of temporal and spatial scales. Such a research program is absolutely necessary for informed policy decisions.

The National Academy of Sciences/National Research Council (NAS/NRC) and the International Council of Scientific Unions (ICSU) are currently formulating such a research program. Their programs are known as the Global Change or the International Geosphere Biosphere Program (IGBP). This program would build upon the many excellent ongoing national and international research programs in Earth sciences and would not duplicate or replace them. In parallel, NASA has developed a Global Habitability program whose goals and objectives are totally consistent with these proposed programs. NASA is ready to cooperate fully in the detailed scientific planning of such a program in conjunction with the scientific community through the NAS/NRC and ICSU, and implementing the U.S. component of this program with the National Oceanic and Atmospheric Administration (NOAA), the National Science Foundation (NSF), the Department of Energy (DOE), and other government agencies. The studies of the Earth System Sciences Committee (ESSC), which was established in 1983 by the Advisory Council of NASA, will provide NASA with a defined near-term program, and a definition of its specific role in Earth System Sciences.

The Upper Atmospheric Research and Stratospheric Processes research efforts are directed towards investigations relating to stratospheric ozone and are funded as part of the Earth Science and Applications Environmental Observations budget. Budget levels for the Upper Atmospheric Research Program are approved at $18.7M and $20.1M in FY 1986 and FY 1987, and proposed for $20.7M in FY 1988. The Stratospheric Processes research program is currently approved for $6.4M and $6.9M in FY 1986 and FY 1987, and is proposed for $7.1M in FY 1988.

Development of the Upper Atmosphere Research Satellite (UARS) is also under development, in preparation for a launch in Fall, 1991. The UARS spacecraft will provide significant information regarding stratospheric ozone. Development of the spacecraft and experiments is approved at $114.0M and $113.8M in FY 1986 and FY 1987, and is proposed at $95.4M in FY 1988.

Investigations in climate change are found in the Climate Research and Analysis program which is a part of Earth Science and Applications Atmospheric Dynamics and Radiation Research and Analysis program. The Climate Research and Analysis program has been approved at $7.7M and $8.9M for FY 1986 and FY 1987, and is presently proposed at $9.2M for FY 1988.

The Environmental Observations payload and Instrument Development budget includes support for several instruments which provide the geophysical parameters essential to the data anlaysis performed in the Earth Science and Applications AR&DA programs. The Measurement of Air Pollution from Satellites (MAPS) instrument provides the first observations of global seasonal variation of carbon monoxide in the Earth's atmosphere. Two Active Cavity Radiometer instruments (ACR-1) are designed to aid in the study of the Earth's climate and physical behavior of the Sun. The Atmospheric Trace Molecules Observed by Spectroscopy (ATMOS) instrument provides information on the compositional structure of the upper atmosphere, including the ozone layer and its spatial variability on a global scale. The resources identified for these projects are estimated at $2.8M for FY86, $4.0M for FY87, and $4.3M for FY88.

The Environmental Observations Extended Mission Operations budget includes operations and data analysis support for satellites which provide essential measurements for the study of climate change, greenhouse effect, and stratospheric ozone depletion. The Nimbus-7 satellite provides data on atmospheric dynamics and chemistry resulting in global ozone measurements that are helping in the understanding of heat exchanges in the atmosphere-ocean system. The Solar Mesosphere Explorer (SME) provides simultaneous measurements needed to understand chemical processes taking place in the mesosphere, including data measurements of ozone. The Earth Radiation Budget Spacecraft (ERBS) provides measurements of the temporal and spatial variations in the Earth's radiation budget to gain basic insight into the causes of climatic fluctuations. The NASA ERBS observatory carries the Stratospheric Aerosol and Gas Experiment (SAGE II) which provides stratospheric aerosol data. The resources for these projects are estimated at $15.6M for FY86, $14.8M for FY87, and $12.9M for FY88.

QUESTIONS SUBMITTED BY SENATOR MIKULSKI

Space Station Servicing Facility

Question: I understand that the Servicing Facility is expected to play a key role in Station maintenance and is needed for servicing of attached payloads, external equipment and platforms. What would be the cost of a full capability servicing facility for Space Station?

Answer: The servicing facility would cost approximately $477 million in 1988 dollars.

Question: What is the rationale for having no funding for Servicing in Block I? Is it not possible to put some servicing capability within reasonable cost in Phase I? What capability is the U.S. losing by delaying the servicing until Phase II? Are we relinquishing our responsibility for servicing to the Canadian's by delaying the U.S. servicing capability?

Answer: The rationale for deferring some of the servicing capabilities is a postponement of the requirements that drove the development of these capabilities. Due to the Challenger accident, the launch of the Hubble Space Telescope (HST) has been delayed and the first servicing has been now scheduled to use the Shuttle rather than the Space Station. AXAF and SIRTF are not approved programs. These spacecraft in part drive servicing requirements. Therefore, servicing requirements have been deferred because the assets requiring servicing will not be operational until the late 1990's.

The servicing of external assets has always been coupled to the use of the Flight Telerobotic Servicer (FTS). Therefore, a delay in the servicing facility will have no impact as to the use of the Canadian system vis-a-vis the FTS. Both systems will be developed and used early in the assembly phase of the Space Station. Both systems will be used as appropriate to handle attached payloads.

Question: How much is being saved by delaying the Servicing Bay until Phase II?

Answer: The deferral of the servicing capability will save approximately $477 million in FY 1988 dollars.

Question: I understand that there is a way to phase in U.S. Servicing Facility in that a piece could be put in place for supporting early Station maintenance and attached payloads at a reasonable cost. I understand that this facility could be grown to a full capability service bay. Please describe this approach?

Answer: The contractors involved in Work Package 3 (WP-3) have studied the incorporation of a servicing facility into the proposed revised baseline configuration. However, the facility would not be required until the late 1990's when these assets require servicing.

Servicing of attached payloads and servicing of the Space Station itself will still be required in the early stages of the program. The FTS and the Canadian Mobile Servicing System will provide the necessary capability to accomplish these tasks. NASA will study the contractor's phase C/D proposals to determine whether other assets would be required to provide requisite near-term servicing.

Question: What would NASA estimate the cost to be for an early limited servicing capability?

Answer: Since an early servicing capability is not required (see previous responses) NASA has not analyzed cost requirements for an early limited servicing capability.

Space Station Platforms

Question: I understand that the Polar Platform is included in your proposed Phase I, but that the co-orbiting platform is delayed. Is the design work going to be done in this first Phase for the co-orbiting platform?

Answer: We plan to both design and develop the co-orbiting platform as part of the Space Station's enhanced capabilities in Phase II. However, commonality savings should be preserved at the subsystem level despite the delay of the co-orbiting Platforms.

Question: What cost efficiencies are we going to obtain during the platform development phase?

Answer: Because of commonality savings in the data management, communications and tracking, and power systems, we expect to achieve some savings in the design phase of the program.

Question: Can we be sure that commonality between the Polar and co-orbital platform are addressed in Phase I?

Answer: Using commonality as an effective cost saving tool is Space Station policy. We intend to design the polar platform in such a way to make the best use of common hardware and software, at the subsystem level, the Phase II design and development of the co-orbiting platform.

Question: How much money is included in Phase I to assure that this is accomplished?

Answer: Although we have not identified a specific amount of investment for the achievement of commonality savings, the dollars are relatively insignificant. These savings are accomplished by assuring there is a generic platform design for both the co-orbiting and polar platforms.

Question: If the two platforms are being designed to be serviceable, is it not important that the U.S. develop a servicing capability concurrently to ensure compatibility?

Answer: The platforms will be designed so that they can be maintained and serviced on-orbit. This servicing entails a platform development approach based on Orbital Replacement Units (ORU's). ORU's can easily be changed on-orbit via an EVA operation. This technique was successfully demonstrated during the Solar Maximum repair mission.

Since the co-orbiting platforms are delayed to the second phase of the program, development of this capability was also delayed.

Space Station Attached Payloads

Question: How many attached payload accommodation points are provided for users in the proposed Block I configuration? Is this adequate to meet user needs?

Answer: We are planning to initially have two payload accommodation points for the users on the Revised Baseline Configuration. For early science planning this should be sufficient; however, as actual user selection begins, a reassessment of this provision will take place and we can then revise our planning as required.

Question: In light of the need for early scientific return from Space Station, could the U.S. provide all of the intended payload attach points in the early configuration? How much does NASA save by delaying of the payload attach points until Phase II?

Answer: We include three additional payload attach points, including one pointing system, in Phase II at a cost of $167 million in FY 1988 dollars. Two attachment points, one fixed and one with a pointing system, appear to be the appropriate number for the truss structure of the Revised Baseline Configuration. All attach points will be provided by the United States.

QUESTIONS SUBMITTED BY SENATOR D'AMATO

Solid Rocket Booster

Dr. Fletcher, in your statement, you mention that NASA is currently in the process of correcting the defects which have been found in the Shuttle's Solid Rocket Booster.

Question: At what stage is NASA in the redesign of the seam of the Solid Rocket Booster:

Answer: A redesign has been baselined for the Solid Rocket Motor (SRM) field joints. This design is a pinned clevis/tang joint that includes a captive feature which inhibits joint rotation and a corresponding change in O-ring pressure. Also, the insulation of the two case segments at the field joints will be bonded. Tooling for the insulation has been received and check out of the molded parts is in process. The first of a series of five static test firings incorporating the baseline design is presently scheduled for July 1987. Joint environment simulator tests using the baseline design, which duplicate SRM ignition, will begin in June 1987.

Question: Based on the status of the booster redesign, can we still realistically expect to resume Shuttle flights by February 1988?

Answer: No we cannot meet the February 1988 launch date. The first launch is now scheduled for June 1988. The new launch date is a result of the recent program decision to add a Countdown Demonstration Test (CDDT) and Flight Readiness Firing (FRF) along with some changes to the SRM insulation configuration. The CDDT and FRF tests are at the end of the processing flow for STS-26, and require that the hardware delivery schedules be maintained. The solid rocket motor redesign, test, and delivery schedule is very success oriented and therefore, some recent changes to the insulation configuration for the joints caused a reassessment of the scheduled flight resumption date.

Question: (If not by February) When can we realistically expect to return the Shuttle to safe flight status?

Answer: The current date for the return of the Shuttle to flight status is June 1988.

Crew Escape System

Question: Following the Challenger accident, it was suggested that a crew escape system be implemented for the orbiters in the Shuttle fleet. Has NASA taken steps to implement such a system?

Answer: NASA has taken steps to implement an orbiter crew escape system for use during controlled gliding flight. The system, designated Phase I, is based on use of the existing side hatch for crew bailout. Quick release and jettison provisions are being added to the hatch to facilitate crew escape. Crew escape equipment including parachutes, survival suits and life rafts is also being provided.

Studies are also being performed on escape systems with the potential for expanded capability, designated Phase II, for possible use in the longer term.

Question: Do you have any projections on the cost of implementing such a system?

Answer: The cost for implementing the Phase I crew escape bailout system is estimated to be $53.4 million dollars spread as follows:

FY 1987	FY 1988	FY 1989	FY 1990
17.7	29.7	4.7	1.3

The FY 1988 request includes sufficient funds for implementation of phase I.

Question: Could such a system be incorporated into existing Shuttles without jeopardizing the anticipated flight date in 1988?

Answer: NASA is currently proceeding toward incorporating the Phase I crew escape system for the first flight, although it is not a mandatory modification. The final decision whether to continue toward first flight implementation will be made following further evaluation.

QUESTIONS SUBMITTED BY SENATOR DOMENICI

Biennial Budget Cycle

Calls for budget reform are increasingly heard as budget deadlines are too often missed, important budget decisions are delayed, appropriation bills and other direct spending legislation are held up in committee, and omnibus spending bills take the place of timely and orderly consideration of individual bills. One procedural reform that is being considered is the two-year budget cycle where budget and appropriations matters would be considered in the first year, and authorizations and oversight would be undertaken in the second year.

Question: Would your department/agency favor a biennial budget process? What benefits would your agency achieve in a two-year appropriation cycle?

Answer: The Adminisration is studying the subject of multi-year budgeting and whether to propose biennial budgeting for appropriations for accounts other than those in the national defense area. Biennial budgeting would appear to have substantial advantages for a number of agencies. With respect to our own agency, we provide the following comments. The uncertain nature of R&D work requires that the budget process accommodate unforeseen technical and schedule problems requiring near-term funding adjustments. These programs require several years of detailed advance study and project definition and involve continual assessment of technology readiness and competing priorities. Annual budget cycles provide the agency with the flexibility necessary to accommodate the rephasing and replanning inherent in higher technology programs.

Question: Approximately what proportion of your annual appropriation request would you consider simply repetitious of the previous year's submission?

Answer: The NASA budget is justified annually on a set of goals and objectives for programs and projects. R&D projects typically have a bell-shaped funding profile with a phased buildup as projects are initiated and a phase down period as objectives are achieved and consequently exhibit wide variation in annual budget requirements dependent on the phase.

Question: What difficulties can you foresee in preparing and submitting a two-year budget to the Congress.

Answer: Research and development projects, by their very nature, are dynamic and the two-year budget cycle would mean that estimates would be made three years or more prior to the accomplishment of the effort and has proven extremely difficult to anticipate that far in advance the technology changes and problems that will occur. A two-year appropriation, if enacted, should include provision for NASA to transfer funds between all appropriations to be able to respond to these changing needs without having to wait up to 12 months for the next appropriation/authorization cycle.

Question: Would you expect to realize any budget savings if you could plan your agency budget on a two-year basis? If so, could you estimate how much?

Answer: NASA has not identified any budget savings from a two-year appropriation.

Question: If you oppose the biennial budget concept, please give this subcommittee your reasons why.

Answer: The reasons for our position to the biennial budget concept are described in the answers above.

Impact of House Budget Committee Recommendations on NASA Programs

Question: The House Budget Committee has assumed drastic cuts in NASA fundign in its committee-reported budget resolution. In the function 250 portion of their budget, the House cuts NASA by $1.0 billion from the President's budget. In comparison, the budget plan reported out of the Senate Budget Committee supports NASA funding at the level requested by the President. What do you foresee as the consequences of funding NASA in FY 1988 at the levels assumed in the House's budget?

Answer: The budget figures included in the question are consistent with our understanding of the Budget Resolution adopted by the House. The reduction of $1 billion from the NASA FY 1988 budget request as contained in this budget resolution would have a profound and destructive impact on this country's efforts to regain momentum in the nation's space program. A reduction of this magnitude would require a reorientation of the entire space program. The Space Station would have to be indefinitely postponed. If the $1.1 billion reduction were applied to Outlays as well, the procurement of the replacement orbiter would have to be delayed. The civil space program would take the brunt to these drastic budgetary actions. Initiation of the Civil Space Technology Initiative would be delayed indefinitely and continued development of such missions as Galileo, Ulysses, Gamma Ray Observatory and Mars Observer would all have to be reexamined, and in some cases, cancelled. The result of this restructuring would be disasterous on space science and manned space activities.

QUESTIONS SUBMITTED BY SENATOR GRASSLEY

Unmanned Earth Satellites and Planetary Spacecraft

Question: I am sure you are familiar with Dr. James Van Allen, a professor of physics at the University of Iowa. Dr. Van Allen, of course, has been involved with the space program since 1946, and in 1958 he discovered two radiation belts surrounding the Earth that bear his name.

Offer me your answer to his point that "nearly all of the important scientific results in space have resulted from the use of unmanned satellites and spacecraft, yet more than two-thirds of NASA's budget is devoted to the development and operation of the Space Shuttle fleet and to a huge permanently manned Space Station." He questions "such a distribution of emphasis."

Answer: Dr. Van Allen is certainly a renowned scientist, as are many of the active and long-term participants in the NASA program. His position concerning the use of unmanned satellites and spacecraft is well known to us and to the research community at large. One of the standing committees of the NASA Advisory Council, the Space and Earth Science Advisory Committee (SESAC), a group of equally renowned scientists, has recently released a report following a two-year study on the state of health of the NASA space research program. That report is enclosed for your attention. In it they recommend two points which are germane to this discussion: 1) that it is inappropriate to rate scientific merit among various science disciplines, and 2) that there is a need to maintain a broad spectrum of activities from the very small, single investigator class payload to the very large, facility class project. We believe, with SESAC, that to maintain the most healthy research program, NASA must provide the spectrum of opportunities desired by the entire national space research community. Any decision to curtail certain activities to the presumed benefit of others must be made in the widest forum possible with discussions between the Executive and Legislative branches of the nation's government.

Cost Efficiencies and Logistics

Question: I note that NASA recently announced it's plans to set up some new operations in the Washington, DC area. I realize this may sound parochial, but how do the COST-EFFICIENCIES AND LOGISTICS involved with this decision, compare with setting up these new operations in...say, Iowa....or for that matter, say in Wisconsin?

Answer: Both the Rogers Commission, appointed by the President, and the Phillips Committee, chartered by the Administrator, called for relocation of certain key program management activities to the Washington, DC area. This applied to both the National Space Transportation System (Shuttle) and the Space Station. Both of these are being implemented. The costs of establishing activities in Washington may be higher than in some other areas of the United States. On the other hand, logistics are simpler near an already established installation, such as NASA Headquarters in these cases, with access to support services as well as relevant elements of the Legislative and Executive Branches. In both instances, the decisions have been responsive primarily to overriding program need.

Question: What effort is being made to diversify NASA's work throughout the country?

Answer: NASA work is distributed throughout the country. Our installations are in eleven states and contract work is performed in almost all of the states of the union.

[From the New York Times, Tuesday, April 1, 1986]

AN EMPTY SPACE IN SPACE PROGRAM

By J.A. Van Allen

IOWA CITY—There is a yawning gap between the two Presidentially appointed commissions scrutinizing the United States civil space program.

While one commission is looking into the causes of the explosion of the space shuttle Challenger, the other, the National Commission on Space, which is mandated by Congress, is visualizing highly futuristic cost-is-no-object scenarios for the activities of the National Aeronautics and Space Administration over the next 50 years.

I am struck by the fact that no corresponding consideration is currently being given to controversial here-and-now issues that are of central importance in NASA's activities during the upcoming 10 to 15 years.

Considering the following:

Nearly all of the important scientific results in space and in the civil and military applications of space technology have resulted from the use of unmanned earth satellites and unmanned planetary spacecraft. But more than two-thirds of NASA's budget is devoted to the development and operation of the space shuttle fleet and, prospectively, to a huge permanently manned space station. Is such a distribution of emphasis really in the national interest?

The principal current and planned use of the shuttle fleet is for the launching of commercial communications and military satellites. Such launchings have been conducted successfully for many years and at much less cost by unmanned, expendable launch vehicles, with minimal risk to human life.

However, the National Aeronautics and Space Administration has discontinued the purchase of well-developed expendable launch vehicles—Atlas, Delta, Scout, Titan—in order to capture all available payloaods for the shuttle and attempt to make it an economically viable system.

Despite that policy decision, the shuttle program continues to wallow in an economic Catch-22, trapped between its own high costs and the impracticality of spreading its overhead costs over a large annual number of launches, on the one hand, and the existence of European competition—the Ariane—and prospective expendable Japanese launch vehicles, on the other.

The Defense Department is returning to primary dependence on expendable launch vehicles in recognition of the fragility and high costs of the shuttle system. Should NASA follow suit?

The vaunted advantages of human crews in space vehicles, derived from a romantic vision of human space flight, have not been sufficiently subjected to critical assessment. Are they immune to full discussion?

"Manufacturing in space" is one of the principal justifications that has been cited by President Reagan and others of like mind for development of a space station or a system of space stations. Yet the cost of such developments is wildly incommensurate with the state of knowledge of the useful manufacture of specialized pharmaceuticals, crystals, etc. in a space station.

The basic research on such possibilities is still embroyonic and can, insofar as it is promising, be profitably pursued in the shuttle itself or in a much more modest space laboratory as exemplified by the recently launched Soviet Mir. Why is the United States rejecting such an approach?

Even before the Challenger disaster, well-founded scientific and utilitarian uses of space technology were suffering severely because of NASA's overriding emphasis on manned flight. Now they are at a standstill for an indefinite period of time. Meanwhile, such Soviet, Western European and Japanese programs are going forward and continuing to erode the United States' leadership in the truly durable products of space exploration and research. Isn't this a matter of national concern?

These issues are, in my view, far more worthy of high-level attention than those currently occupying the National Commission on Space.

QUESTIONS SUBMITTED BY SENATOR BYRD

Expansion of the RECON NETWORK in West Virginia

Question: NASA has been working closely with West Virginia University and my office on the expansion of the RECON NETWORK in West Virginia and on developing a Center for the Commercialization of Space. Both of these projects will expedite the transfer of technology to U.S. businesses. Unfortunately, our foreign competitors, especially Japan, are able to apply U.S. technological developments to the world marketplace much faster than we are able to transfer that same technology to our own U.S. industries. Obviously, NASA plays a vital role in the development of U.S. technology.

With regard to the RECON network, how much funding does your FY 1988 budget request for the expansion of that network? Please provide a timetable for the expansion of the network, and a breakdown of the dollars required to implement that expansion. Also include the dollars associated with training and support services for that expansion.

Answer: NASA support of expansion of the RECON network within West Virginia, to date, has involved assistance from and participation by various elements of the NASA Technology Utilization (TU) Program, including the Industrial Applications Centers and the TU Database Systems Office, as well as support from the NASA Scientific and Technical Information Facility. To date, this support has primarily involved workstation installation at West Virginia University (WVU), the designated operational center for RECON activities, and training and orientation of personnel. During FY 1988, it is anticipated that WVU RECON capabilities will be enhanced by the installation of, and provision of training for, NASA-developed software for computer-assisted evaluation of relevance of retrieved database items and associated sorting of such items according to selected relevance criteria. Though there is no distinct FY 1988 budget line item associated with this activity, NASA anticipates that the enhancement described above, together with continued training and network support, will involve a cost of approximately $10,000.

Centers for the Commercial Development of Space

Question: With regard to the Centers for the Commercialization of Space, it is my understanding that NASA has initiated a competition for eight centers. How much funding does your FY 1988 budget request for those Centers? Please provide an overview on your long-range plans for those Centers, as well as the associated dollars required in FY 1988, 1989 and 1990.

Answer: We have initiated the third round of solicitations for proposals and expect to establish up to six new Centers for the Commercial Development of Space (CCDS). The funding for FY 1988 is $13 million to support these and the existing nine CCDS's. We currently plan on a fourth round of solicitations to establish new CCDS's in 1988 and the budgets we anticipate needed to support the CCDS program are as follows:

FY 1988 - $13 million
FY 1989 - $14 million
FY 1990 - $14 million

Space Robotics Program

Question: On another issue, there has been considerable discussion in the last few years over the need to rely on robotics in our space program, such as in the construction of the Space Station. How much funding does NASA plan to dedicate to that program development in FY 1988? Would you provide information on both your short- and long-term plans for developing a space robotics program? Please include information on any research centers that NASA may be contemplating as a part of this research program, as well as the dollars associated with those centers that would be required in FY 1988, 1989 and 1990.

Answer: The NASA Space Station activities in robotics are focused on the development of the Flight Telerobotic Servicer for the Space Station. It is budgeted at $22 Million in FY 1988. The Office of Aeronautics and Space Technology is involved in a research and development program budgeted at $11.5 million in FY 1988, and some smaller tasks developing special equipment for the remote manipulator system on the Shuttle. Finally, the Office of Commercial Programs has competitively awarded a $1 million grant for a robotic center through its centers for the commercial development of space programs.

The NASA plans for the Flight Telerobotic Servicer are outlined in the attached Program Plan. The OAST robotics research and development program is one element of the Civil Space Technology Initiative, which is an FY 1988 new initiative. The goal of this program is to evolve remote operations from teleoperation to robotics and to increase operational capability for on-orbit assembly, servicing and repair, and planetary exploration.

The Goddard Space Flight Center has been assigned the responsibility for the development and implementation of the Flight Telerobotic Servicer. Several NASA Centers as well as universities and laboratories, are involved in supporting this endeavor.

The University of Wisconsin has been competitively awarded a five year grant for a robotic center as a part of the NASA commercial program with matching funds from industry.

OAST will initiate collaborative efforts in robotics research with a number of industry and university institutions. Several NASA Centers will be involved in these activities as well. Establishment of one or more centers of excellence may be considered in the future.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

PRELIMINARY PROGRAM PLAN
FOR THE
SPACE STATION
FLIGHT TELEROBOTIC SERVICER PROGRAM

FOREWORD

NASA shares the commitment of Congress and the Nation to advance the technology of automation and robotics for the benefit of Space Station and the United States economy as a whole. It recognizes that an aggressive Flight Telerobotic Servicer Program for Space Station makes possible new advances in science and technology, allows for the creation of commercial opportunities, and demands partnership among university, industry, and government organizations. The detailed program requirements that are now being generated promise the most obvious results. The total benefits, not yet imagined, will unfold as the program progresses.

The National Aeronautics and Space Administration Office of Space Station has assigned development and implementation of the Flight Telerobotic Servicer to the Goddard Space Flight Center Space Station Office as part of its responsibility to the Space Station Program for Work Package-3.

This plan establishes a foundation upon which the Goddard Space Flight Center will lead a network of organizations to provide a continuing Flight Telerobotic Servicer capability for Space Station and to ensure an expanded robotics capability of tomorrow.

Andrew J. Stofan
Associate Administrator
Office of Space Station
National Aeronautics and Space Administration

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INTRODUCTION

Background

The Flight Telerobotic Servicer (FTS) is the result of discussions between NASA and the Congress on how the Space Station Program could best be utilized to enhance the technologies of robotics and machine intelligence. Mandated by Congress in the Conference Report accompanying NASA's FY 1986 Appropriations bill, the FTS is an outgrowth of the Automation and Robotics (A&R) initiative of the Space Station Definition and Preliminary Design Phase ("Phase B").

The FTS is a highly automated telerobotic device capable of precise manipulations in space. It will operate with a mix of remote and supervisory control by astronauts. It will be used to assist in assembly and servicing operations. The FTS will improve the efficiency and safety of Space Station related operations. Initially intended for relatively simple tasks, the FTS capabilities will evolve over time to accommodate increasingly sophisticated operations. Invaluable not only for Space Station operations, the FTS and its technologies will have wide application in both space and on the ground.

The Goddard Space Flight Center (GSFC) has been designated as the development and implementation Center for the FTS. Technical and management activities at GSFC are continuing to focus and drive the implementation of the FTS Program in response to the A&R objectives of the Space Station Program.

Early in Space Station planning, NASA initiated a study to determine the most effective manner of applying A&R technologies both to enhance the Space Station and to provide the desired development impetus. The NASA Advanced Technology Advisory Committee (ATAC), established by NASA at the direction of Congress, evaluated the recommendations of universities, aerospace and automation related industries and government laboratories, integrating them into a comprehensive set of recommendations for further study by the Space Station Phase B Contractors. These recommendations may be summarized as follows:

- Automation and robotics should be a significant element of the Space Station Program.
- The initial Space Station should be designed to accommodate evolution and growth in automation and robotics.
- The initial Space Station should utilize significant elements of automation and robotics technology.
- Criteria for the incorporation of A&R technology should be developed and promulgated.
- Verification of the performance of automated equipment should be stressed, including terrestrial and space demonstrations to validate technology for Space Station use.
- Maximum use should be made of technology developed for industry and Government.
- The techniques of automation should be used to enhance NASA's management capability.
- NASA should provide the measures and assessments to verify the inclusion of automation and robotics in the Space Station.

During the course of the Space Station Phase B Study, the ATAC continued to monitor the implementation of these recommendations. As a result of the efforts to date, Space Station functions which would benefit from application of robotic technologies have been identified and robotic concepts have been evaluated.

Scope

The purpose of this plan is to inform the Congress of the progress NASA has made in defining and initiating the Space Station FTS Program. This plan establishes a foundation upon which NASA will manage the Space Station FTS Program. It addresses objectives, organization roles, overall program schedule, and the procurement approach.

OBJECTIVES

National

The objectives of the United States in committing through NASA to a program of A&R emphasis may be broadly stated as follows:

- Identify and develop technologies of Space Station automation and robotics not only to increase the efficiency of the station itself but also to enhance the Nation's technical and scientific base leading to more productive industries here on Earth.
- Ensure that United States industry be able to make use of the Space Station as a vehicle for vital spinoff benefits to automation and robotics fields.

In addition, the National Commission on Space was appointed by the President of the United States and charged by the Congress to formulate a bold agenda to carry America's civilian space enterprise into the 21st century. The Commission recommended in its report, Pioneering the Space Frontier, that initial operation of a permanent Space Station is one of the twelve technological milestones for pioneering the space frontier, and recognized that development of telerobotic systems is necessary to carry out the long-range civilian space program.

Program

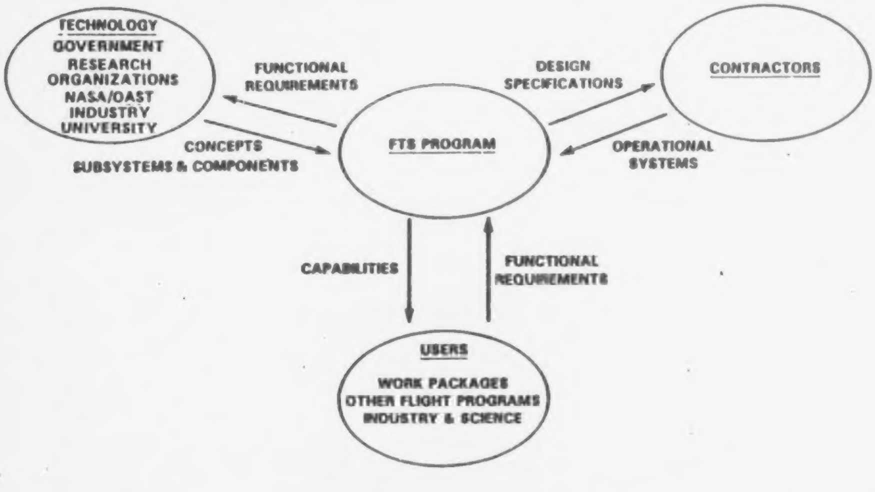
Consistent with these national objectives, overall FTS Program objectives have been developed as part of the Space Station Phase B study. These objectives are delineated herein.

- Provide the capability to use telerobotics for the assembly, checkout, and maintenance of the Space Station to minimize the amount of extra-vehicular activity required of the crew:
  - decreasing the time necessary to construct and assemble the Space Station elements
  - releasing the crew to deal with contingencies, problem solving, and supervisory functions
  - reducing the risk to personnel safety during the process

- Use telerobotics beginning with the initial operational phase of the Space Station to:
  - increase crew productivity (with astronauts functioning as managers rather than as performers of routine tasks)
  - increase probability of mission success
  - reduce risk by telerobotic remote performance of potentially hazardous tasks

- Use and evolve telerobotic capabilities during the growth and maturity phases of the Space Station to:
  - increase crew productivity by leveraging the crew resource to enable large scale assembly and multiple, simultaneous servicing and maintenance activities
  - decrease operational outage by enabling in-situ servicing of free-flying spacecraft
  - increase Space Station safety by providing regular inspection and contingency repair capability

- Establish an approach which first, enables the transfer of technology from NASA's Office of Astronautic and Space Technology, other governmental research organizations, industry, and universities to flight telerobotic systems development and which second, facilitates transferring the knowledge gained through the operational use of those systems back to industry and universities. Industry and universities act as innovators of robotic technologies, developers of systems using robotic technologies, and users of those systems. This objective provides a focus for coordinating and accelerating the interaction of these functions resulting in benefits to the United States economy. See Figure 1.


TECHNOLOGY
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UNIVERSITY
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DESIGN
SPECIFICATIONS
CONTRACTORS
CONCEPTS
SUBSYSTEMS & COMPONENTS
FTS PROGRAM
OPERATIONAL
SYSTEMS
CAPABILITIES
FUNCTIONAL
REQUIREMENTS
USERS
WORK PACKAGES
OTHER FLIGHT PROGRAMS
INDUSTRY & SCIENCE

Figure 1. Flight Telerobotic Servicer Program as a Technology Transfer Focus

PROGRAM APPROACH

The program outlined in this document will result in two different yet mutually supportive products: first, a robot system that will be incorporated in the Space Station to assist in Station assembly and maintenance, and in servicing attached instrument payloads and docked or remote spacecraft and platforms; second, a focused Agency capability to quickly move robotic technology into productive flight systems with high visibility and to coordinate the functions needed to maximize the benefits for the Nation. The second item is created by, and in turn supports the first.

The designs and plans proposed for the telerobotic system, the FTS, will respond to the requirements derived from the Program Objectives, Space Station needs and constraints, and operational scenarios. They will also respond to the Congressional directive contained in the Conference Report accompanying NASA's FY 1986 Appropriation bill for delivery of a Flight Telerobotic System.

The term "Telerobotics" refers to a hybrid capability for the robot to operate either under direct control of a human operator (teleoperation) or to carry out tasks autonomously in accordance with self-contained rules, data base knowledge, and sensor inputs, with varying levels of intervention or direction by an operator (supervised autonomy). The FTS resulting from this plan will initially require considerable human control and attention. However, demands upon astronaut time and the need to maximize efficiency of the crew resource coupled with knowledge resulting from operational experience will dictate increasing robot autonomy. Although the work will be performed in a single development program, the FTS will operate at any of several different locations, that is, within the servicing bay, on the Mobile Servicing System (MSS), remotely on the OMV, at work sites on the Space Station truss, and on the National Space Transportation System (NSTS) Orbiter and Remote Manipulator System (RMS). To accommodate different manipulation tasks, the system will be modular. Basic hardware and software components will be reconfigurable for specific applications, while conforming to a common architecture. The design will permit system evolution to supervisory control while maintaining systems safety and high levels of crew confidence.

A technology base from which to start this development exists in the manufacturing industries, in nuclear energy operations, in maritime exploration, and in NASA itself. The special problems associated with transferring this technology to space systems will be addressed. The mechanical designs and control system architecture will be carefully chosen so as to permit later incorporation of new end-effectors with improved dexterity, additional coordinated appendages, enlarged data bases, new sensors, and more sophisticated reasoning, as the Space Station evolves. The FTS is a system that will be transparent to the continuing improvements and additions that emerge from new technology.

The ability to select and implement the evolving technology resides in the development of an adequate network of facilities to evaluate the technology, demonstrate its performance, and train for its use. This network consists of a laboratory for telerobotics integration and performance evaluation, and facilities for interface verification, simulations and operational training. The laboratory will be used to bring together various concepts, hardware, software, and mockups of tasks to be done. The interface verification, training, and simulations functions will be accomplished by upgrading and modifying facilities at the various Centers assigned those responsibilities. Communications links to couple the facilities will be established to maximize the network flexibility.

The program will be implemented by establishing and coordinating four major elements:

- A Technology element to select, modify, and transfer evolving technology and to identify requirements for new technology
- A Flight Demonstration element to conduct demonstration flight(s) on the NSTS prior to Space Station assembly for verification of design and operations concepts
- A Space Station Flight System element to deliver, operate, and evolve an FTS for use by the Space Station Program
- A Ground System element to provide continuing capability to evaluate and implement advanced robotic technology, and to assist training operations and FTS on-orbit performance evaluation

Technology

The Technology element of the FTS Program uses the FTS as a vehicle to rapidly move newly developed concepts from the laboratory into flight systems and back into the science and industrial communities as proven concepts. The Technology element is necessary to maximize both the benefits of telerobotics to the Space Station and the potential returns of advanced robotics to the United States industry. Technology evolution and implementation must be viewed as an ongoing process that is accelerated when given the appropriate focus and resources. The FTS Program is providing that focus for robotic development activities.

The specific objectives of the FTS Program Technology element are:

- Maintain a continued awareness of advances in telerobotic technology
- Acquire advanced telerobotic technology for ground evaluation and use in Space Station flight systems
- Provide technological challenges to research and industry based on identified requirements
- Develop new applications for advanced telerobotic technologies
- Provide for the enhancement of the nation's scientific and technical base leading to more productive industries on earth
- Promote the commercial utilization of telerobotic technologies proven in space applications

The implementation of the Technology element to meet the stated objectives can be explained by referring to Figure 2. This Figure shows graphically that the robotic technology evolution process continually moves around the research base. The research community (industrial, university, and government) is involved at every step in this process. New technology concepts and components that emerge as potential solutions to requirements are evaluated and combined to develop flight systems with improved capabilities. Then, review and analysis expertise are provided to ensure a continuing new technology influence on the development, ground evaluation and operations activities. This both makes the implementation of the new technology more effective and provides a continuity to the technology base. Other key interactions between technology and flight systems occur when new technology is selected and when new requirements are identified.

It is critical that technology representatives participate in the decision process. To ensure this, GSFC will establish a steering committee which will be convened on a regular basis and which will incorporate participation by NASA Headquarters, the NASA Centers, and representatives of technology users, researchers, and developers from other organizations. The steering committee will be accountable for recommending priorities and methodologies of technology transfer to and from the FTS Program. The steering committee will document its recommendations as a publicly available report.

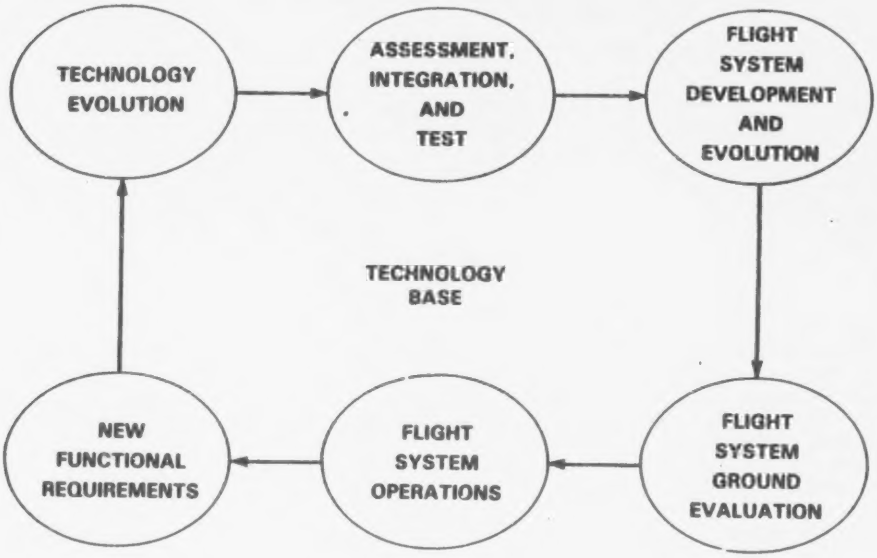

TECHNOLOGY EVOLUTION
ASSESSMENT, INTEGRATION, AND TEST
FLIGHT SYSTEM DEVELOPMENT AND EVOLUTION
TECHNOLOGY BASE
FLIGHT SYSTEM GROUND EVALUATION
FLIGHT SYSTEM OPERATIONS
NEW FUNCTIONAL REQUIREMENTS

Figure 2. Technology Transfer Flow

The initial activities that have been employed for the FTS Program, center on hardware and software that are already under development. Office of Aeronautic and Space Technology (OAST) supported research will produce an advanced teleoperated manipulator system, "smart" end-effectors, hand controllers and control system software. The National Bureau of Standards (NBS) is developing a subset of their control system architecture for Space Station telerobotic applications. The proposed standard control system architecture is being reviewed by representatives from most NASA Centers, to recommend improvements to the standard. Various standard connectors and tools are being proposed by industry and within NASA. These technology advances are being studied and will be evaluated for applicability to the flight demonstration and/or the Space Station flight system. NASA will consider proposals from industry for demonstrations of evolving technology that can best be done in NASA facilities. Detailed agreements have been reached on some items. These include deliverables, schedules, and appropriate funding to produce copies or modified versions of the OAST products.

Flight Demonstration

Prior to the start of Space Station assembly, NSTS flight(s) will carry a telerobotic unit to demonstrate operation and technical aspects of the FTS. The telerobotic unit will be operated by an astronaut from the orbiter aft flight deck. The objectives of the Flight Demonstration element are to:

- Validate FTS hardware design
- Evaluate the FTS task interface and performance capabilities in a space environment
- Provide engineering data for FTS verification and ground laboratory calibration
- Support Space Station operational planning
- Evaluate the man/machine interface

The Flight Demonstration element will show, as a minimum, the capability to assemble Space Station thermal utility connections and to remove and replace an Orbital Replacement Unit (ORU) in a space environment. An approach that may be used to demonstrate truss assembly capability (another task that may be assigned the FTS) could be connecting a set of struts and truss-nodes without assembling an entire truss element.

Additional tasks may be accomplished by the flight demonstration system which include primitive autonomous operations. In addition to providing the validation of the FTS hardware design, the demonstration will gather critical engineering data for ground evaluation and calibration of the ground testing facilities. Engineering data that will be collected during the flight demonstration activity include force applied by the end effectors, stability of arm motions, and placement accuracy.

The Flight Demonstration element will support operational planning by providing evaluation of task timelines in the space environment. The astronaut interface with the control system will be evaluated under actual operational conditions.

The flight demonstration system will be designed under the ground rule that standard STS payload accommodations are used where possible in order to contain costs and to maintain schedule. The flight demonstration telerobot design will be based on the initial flight model, which is presently conceived to be a central body with four manipulator arms and associated end-effectors. While the flight demonstration system may not include all the physical attributes of the final flight model, it must be capable of dual arm manipulation. The detailed operational plan and the physical configuration of the flight demonstration telerobot will be developed during early tests at the GSFC and Johnson Space Center (JSC) facilities. Early crew participation and training will also be accomplished. Final performance testing and crew training will utilize the flight demonstration unit at the GSFC facility prior to shipment to the Kennedy Space Center (KSC) for launch.

Figure 3 shows a concept of the demonstration telerobot attached to the RMS simulating an experiment servicing function. Using the RMS, an astronaut will be able to remove the robot from the pallet where it was rigidly affixed for launch and position it next to the experiment and tool box pallet for the assembly and servicing demonstrations.

The current plan is that all electrical connections to the robot will be through an umbilical cable, so as to minimize modifications to the RMS. To guide and monitor the performance of the robot, the astronaut may use the existing television cameras

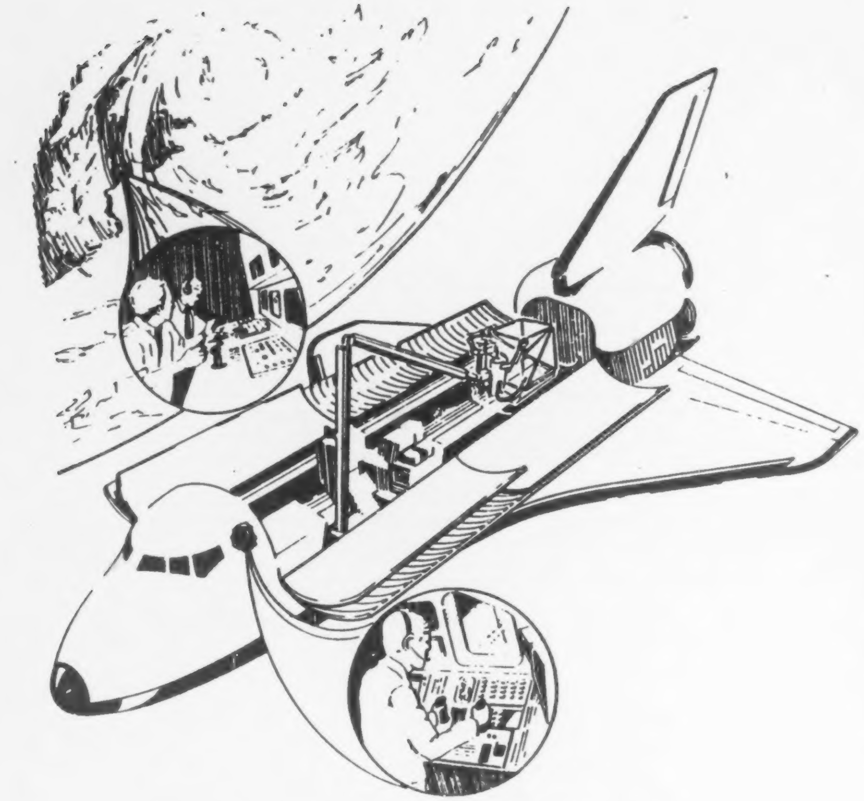


Figure 3. Demonstration Flight Concept

on the RMS or cameras on the robot. The telerobot will be controlled from the aft flight deck of the orbiter using a control station that is tied into the standard payload accommodations. This control station will consist of the control input mechanisms, electronics, displays, and control switches necessary to operate the telerobot. The telerobot control station will be separate from the RMS control station. The goal is to develop a mobile, stowable, telerobot control station to allow efficient integration into the orbiter crew environment and that maintains modular design compatibility with Space Station work station requirements.

The FTS contractor, working in close association with the FTS laboratory network, will evaluate the space qualifiable design which will be used for the flight demonstration system. The flight demonstration hardware will be delivered to the GSFC for test and evaluation before flight. Software control algorithms and dynamic and man-in-the-loop simulations will be developed and tested as part of the verification program.

Space Station Flight System

The FTS that is carried into orbit with the initial Space Station assembly flights will be in a configuration capable of performing a subset of tasks from among those many tasks identified for the assembly, maintenance, and operation of the Space Station. This configuration will derive from an analysis of selected tasks to develop design requirements. The Space Station flight element design requirements also must be constrained by a realistic assessment of the ability to assimilate and build upon United

States robotics technology within specified budget and schedules. The initial flight configuration delivered for the First Element Launch (FEL) of Space Station must be capable of replacing a platform ORU and assembling the core station thermal utility connections. In addition, it will be a baseline for further growth and development, a vehicle to focus robotics technology, and a source for technology transfer to United States industrial and research and development communities. The objectives of the Space Station Flight element are to:

- Develop an FTS for assistance in assembly and operation of Space Station and servicing of payloads and platforms
    - Increase crew safety
    - Reduce extra-vehicular activity (EVA)
    - Reduce operating cost
    - Establish a foundation for continued technology evolution
    - Complement human roles in space
    - Ensure FTS equipment safety and reliability
- Deliver the FTS
    - FTS robot and standard end-effectors
    - FTS control stations for STS and Space Station
    - Operating software and procedures
- Operate the FTS and evaluate the FTS performance

The FTS will be a multipurpose tool that serves as an extension of the astronaut for performing EVA functions. It will be able to participate in the assembly of the Space Station and in the maintenance of the Space Station during and after assembly. It will also be able to support Space Station payload assembly, installation, and servicing. For initial assembly of the station, just as for the Flight Demonstration that precedes assembly, it must interface with the STS RMS and will require a control station on the STS. For subsequent assembly, for ORU changeout, and for servicing, installation, and assembly of Space Station payloads, it must interface with the MSC and the Servicing Bay Locating Arm to carry it to work sites throughout the Station and within the Servicing Bay. Operations from the station require a control station(s) within a Space Station pressurized module.

The FTS will also interface with the OMV for transport to remote platforms and free-flyer spacecraft for in-situ assembly and servicing operations, including refueling. The tasks which are currently being analyzed include servicing of the Hubble Space Telescope and refueling the Gamma Ray Observatory. For these functions a ground station will provide the capability for operation while freeing valuable space-based personnel and equipment.

The FTS will be designed to support the policy of growth to a very high level of automation and it will be capable of both teleoperated and autonomous operation. Growth toward autonomy and independence have significant implications on both the physical and logic structures of the FTS. The hardware (such as arms, sensors, end-effectors, motors, and microprocessors) and the software which controls that hardware and provides data base access must be modular and structured to allow implementation of new capabilities, changes, and improvements.

Additional requirements call for light weight and Intravehicular Activity (IVA) serviceability. These requirements impose size limitations.

The tasks which were analyzed as a basis for the FTS design requirements and reference concept were first broken down into sequences of simple steps independent of the devices performing the task. Telerobotic performance of the tasks was then evaluated and the design requirements for the FTS were established. A basic operational constraint is that critical tasks will not be planned that can only be performed by the FTS. All critical tasks must be able to be performed by suited EVA astronauts equipped with adequate tools. As a result of these requirements and constraints, the FTS has been conceived of as a near man-sized, very modular unit with the capability to do tasks requiring dexterity approach ing that of a suited astronaut.

An example configuration concept which has emerged from analysis is shown in Figure 4. Four arms are postulated to meet the requirements for dual arm cooperation and dexterity and to attach firmly to a work site. Figure 5 shows additional detail in the concept, illustrating modularity in the robot.

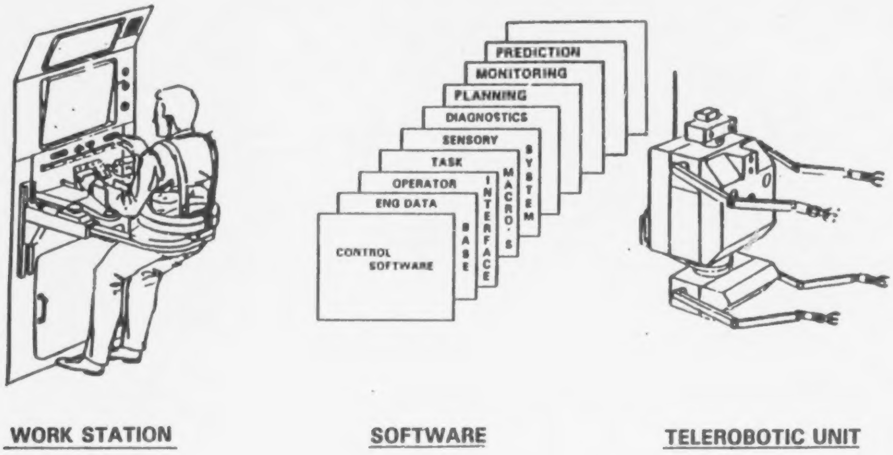


Figure 4. A Flight Telerobotic Servicer Concept

The FTS will be refined by utilizing results from the flight demonstration and ground system. The technology and data from these parts of the program will be merged into the flight program. Contractor design, development, test and evaluation activities will also provide an engineering test unit to prove concepts at the contractor facilities and at the GSFC ground facility. Final test and evaluation of engineering and flight models will take place at NASA facilities. The engineering unit and mockups of the Space Station flight unit will be made available to the other NASA Centers working in close coordination for integration of the system into the Space Station Program. Interface simulation hardware and software will support interface testing for the initial flight configuration and for the duration of the flight program as operations are sustained and the growth program implementation continues.

Operational experience will improve crew productivity as we learn how to use the telerobotic system and the ability to reduce costs and achieve goals will expand. Unanticipated growth and applications will emerge developing an extremely high potential to benefit both the United States civilian space program and industrial productivity.

Ground System

The Ground System element of the FTS Program will coordinate a network of telerobotic laboratories within NASA to:

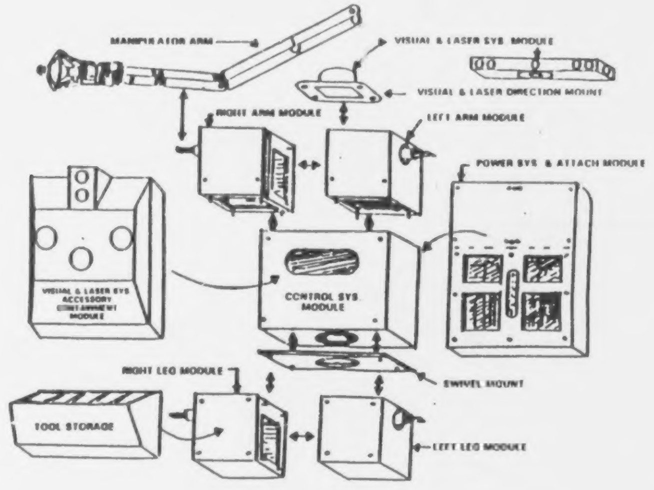
- Perform engineering analyses and simulations of telerobotic tasks to determine technical requirements and measure performance
- Test and verify telerobotic components, subsystems, and systems as they apply to Space Station needs
- Evaluate and integrate advanced technology into flight telerobotic systems
- Develop and simulate operational scenarios and provide crew training
- Define and verify telerobotic operations with the RMS, MSC, OMV, and the Space Station Control Center
- Define and verify telerobotic interface to the user systems
- Evaluate flight performance and resolve problems

ENVELOPE

- SIZE RANGE (FEET) 3×3×6 TO 4×4×7
- WEIGHT RANGE (POUNDS) 600 TO 1000
- POWER RANGE (KILOWATTS) STANDBY 0.2 TO 0.6 WORKING 2 TO 3

CONSTRAINTS

- SAFETY
- MAINTAINABILITY
- TECHNOLOGY TRANSPARENT


MANIPULATOR ARM
VISUAL & LASER SYS MODULE
VISUAL & LASER DIRECTION MOUNT
RIGHT ARM MODULE
LEFT ARM MODULE
POWER SYS & ATTACH MODULE
VISUAL & LASER SYS ACCESSORY CONTAINMENT MODULE
CONTROL SYS MODULE
RIGHT LEG MODULE
SWIVEL MOUNT
TOOL STORAGE
LEFT LEG MODULE

A POINT OF DEPARTURE FOR STUDY

Figure 5. A Telerobot Modularity Concept for the Flight Telerobotic Servicer

The ground system implementation will proceed based upon derived functional requirements for test facilities. It will allocate these requirements based on existing capabilities and the roles of the NASA Centers in the Space Station Program. It will therefore implement the laboratory capabilities with a minimum of new facility development by establishing and maintaining a facilities requirements data base, developing laboratory capabilities phased to the FTS development and operations schedule, and augmenting laboratories based on continuing technology products. The ground system element of the FTS Program will maximize the utilization of advanced technologies being developed by NASA/OAST, other agencies, and industry.

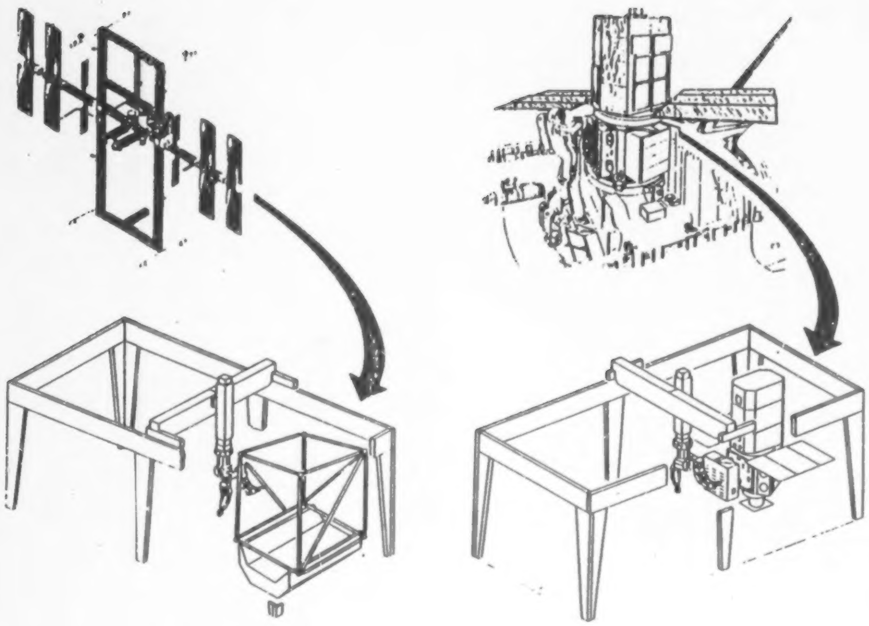


Figure 6. Ground System Concept for Testing Robot Servicing of Space Flight Hardware

An important early step will be the development of a ground telerobot evaluation unit. The systems making up this unit will be similar in form, fit, and functional characteristics to those of the flight systems. It will be used with mock-ups of Space Station elements to allow development of detailed telerobot operational procedures and designs which are "friendly" to robot implementation in support of the flight demonstration and flight program.

At the GSFC, a telerobotic evaluation system is being implemented using an overhead gantry as illustrated in Figure 6. Gantry systems are commercially available and offer working volumes, lift capacities, and accuracies that will allow them to manipulate ORU's and other objects with structural and functional characteristics similar to flight units. High fidelity test mockups of flight ORU's will be used to verify the telerobotic systems.

The test and verification facilities at GSFC will be modified to accept the FTS and to perform limited simulation of a low-g environment. The Orbiter mockup in these facilities will be modified to accept the early flight demonstration hardware and to develop early scenarios for operating procedures.

At the JSC, the RMS training facility will be modified to accommodate the FTS hardware and to verify man-machine interfaces and evaluate the crew operating procedures. The Manipulator Development Facility (MDF) will be upgraded to carry the weight of the FTS on the RMS. The STS and FTS control station designs will be evaluated and verified for man-machine interfaces in this facility. A special GSFC to JSC data link for the facilitating evaluation of remote operation of telerobotic system is envisioned.

The Marshall Space Flight Center (MSFC) will provide definition and verification of the OMV interface. Combined OMV/FTS operations will be verified in the OMV operations simulator through the use of the Dynamic Overhead Target Simulator (DOTS) located at MSFC. This facility will be upgraded to support evolution of the combined OMV/FTS performance.

The Lewis Research Center (LeRC) will provide functional and interface requirements for power system elements.

Since the flight robot manipulator configurations are expected to be low force, lightweight designs, their capabilities on the ground will be limited compared to capabilities in space. To test the flight robot configuration and the object to be worked upon in a one-G environment, special techniques will be employed. For example, the active hardware may be directly supported or counterweighted, partially simulating weightless operation. However, most limitations of ground testing can be overcome by conducting tests in space on the Orbiter and later on the Space Station itself. It is planned to use the data acquired in this manner to calibrate the ground facilities for comparisons and to validate the results of ground tests of the evolving technology to be incorporated into the flight system. The network of NASA laboratory facilities supporting the FTS system development will also provide capabilities to:

- Develop operation scenarios for customer servicing and Space Station maintenance using the FTS
- Verify interfaces of FTS to unique customer hardware in a clean facility
- Perform troubleshooting in response to real time operational problems
- Support analysis and evaluation of expected versus actual performance characteristics for the FTS system

The ground system laboratory network will provide a continuing capability to conduct significant testing of evolutionary developments for the FTS thus incorporating technology advancements into systems implementation prior to flight use on the Space Station. The FTS Program will encourage the use of its laboratory network by the OAST research program to the fullest extent appropriate.

MANAGEMENT STRUCTURE

The GSFC Space Station Office (SSO) is accountable for the management of the FTS Program within the Work Package-3 structure. In order to realize the FTS Program objectives, the GSFC SSO will capitalize on the existing organizational capabilities resulting from NASA's OAST programs, from the work of the NASA Office of Commercial Programs, and from the allocation of responsibilities for the Space Station Program.

This section identifies the network of NASA organizations that the GSFC SSO will lead. It also presents the roles of those organizations that are accountable for major deliverables for the FTS Program accomplishment. The GSFC SSO will establish specific agreements with those organizations and will facilitate communications forums both for enabling creative dialogue among the team and for sharing the status and results of their work. Program direction and control procedures will be consistent with management practices established for the Space Station Program by the Associate Administrator for the Office of Space Station.

Organization

GSFC has established an FTS Project Office. The FTS Project Manager reports directly to the Head of the GSFC SSO who in turn reports to the Space Station Program Director and to the Director of the GSFC. The FTS Project Manager is accountable to:

- Define, direct, and manage the FTS Program
- Provide a management focus for the development and execution of the four program elements
  - Technology
  - Early Flight Demonstration
  - Space Station Flight System
  - Ground System
- Conduct ongoing strategic planning and control for the FTS Program
- Develop operations plans and procedures
- Report program status

The FTS Project Manager will develop the bases for agreements between the GSFC SSO and other organizations as related to the FTS Program. In addition the FTS Project Manager is accountable for the status and direction of work associated with those agreements and the FTS Program as a whole. Figure 7 shows the organizations that have a management interface with the FTS Project Office. Figure 8 shows the FTS Project within the GSFC Space Station Organization.

Roles

The Associate Administrator for the OAST is responsible for generic research in the area of automation and robotics. The FTS Project Office will build upon the advancements from that work. When applicable, the Associate Administrator for the Office of Space Station will enter into formal agreements with the Associate Administrator for the OAST for acquisition of specific robotics technology elements for use in the FTS Program. The basis for these agreements are developed and coordinated by the FTS Project Office.

The FTS Project Office will coordinate with the NASA Office of Commercial Programs on matters relating to interfacing with industry and universities for transferring flight robotics technology resulting from the FTS Program activities. Examples of avenues for transferring technology that will be investigated include conducting briefings on the capability of the Space Station integrated network of ground laboratories for robotics system development, conducting symposiums on telerobotic applications that center on results from the FTS Program, encouraging use of NASA laboratories for robotics experimentation, and promoting use of the Space Station telerobot for developmental purposes.

The FTS Project Office will use the capability of the GSFC technical directorates in executing GSFC's role in the FTS Program. As with other organizations, the FTS Project Office will develop specific agreements upon which this relationship will be based. The roles of all the NASA Centers involved in the FTS Program are presented in Table 1.

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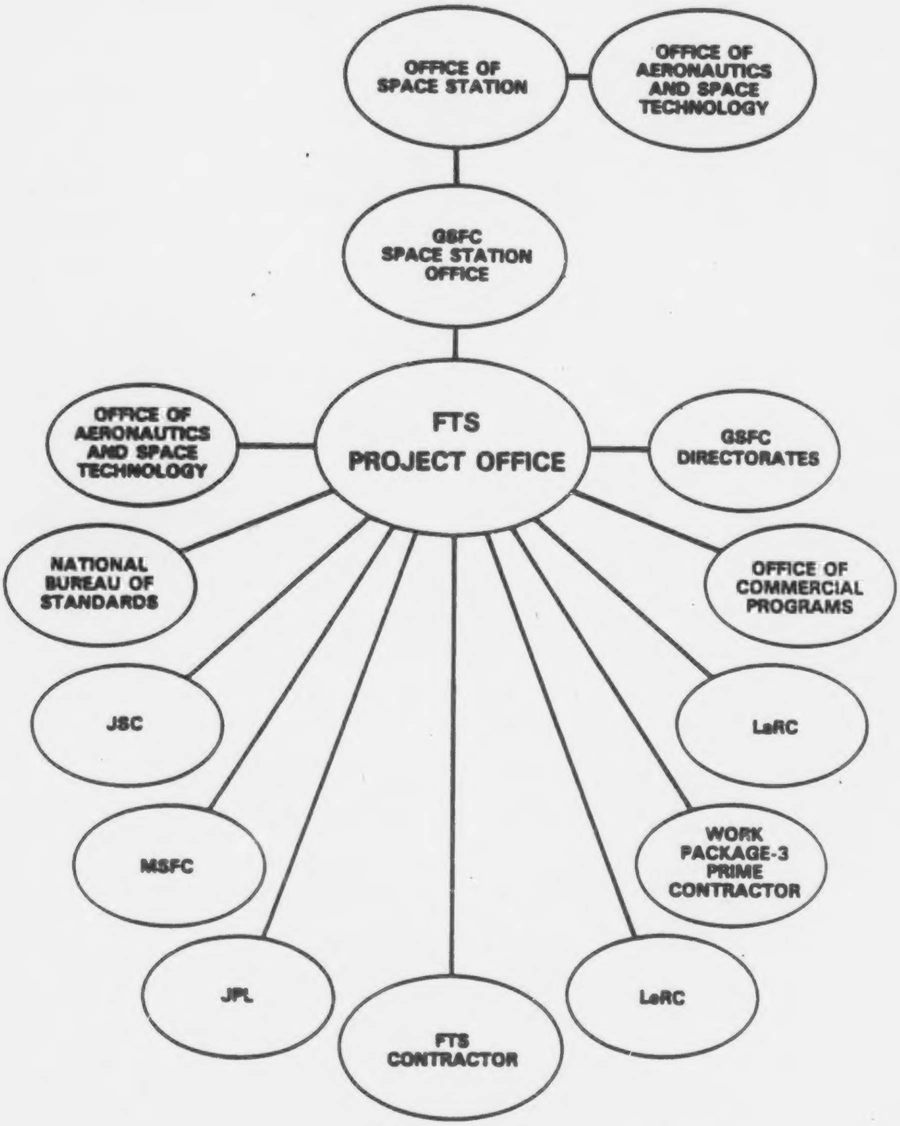
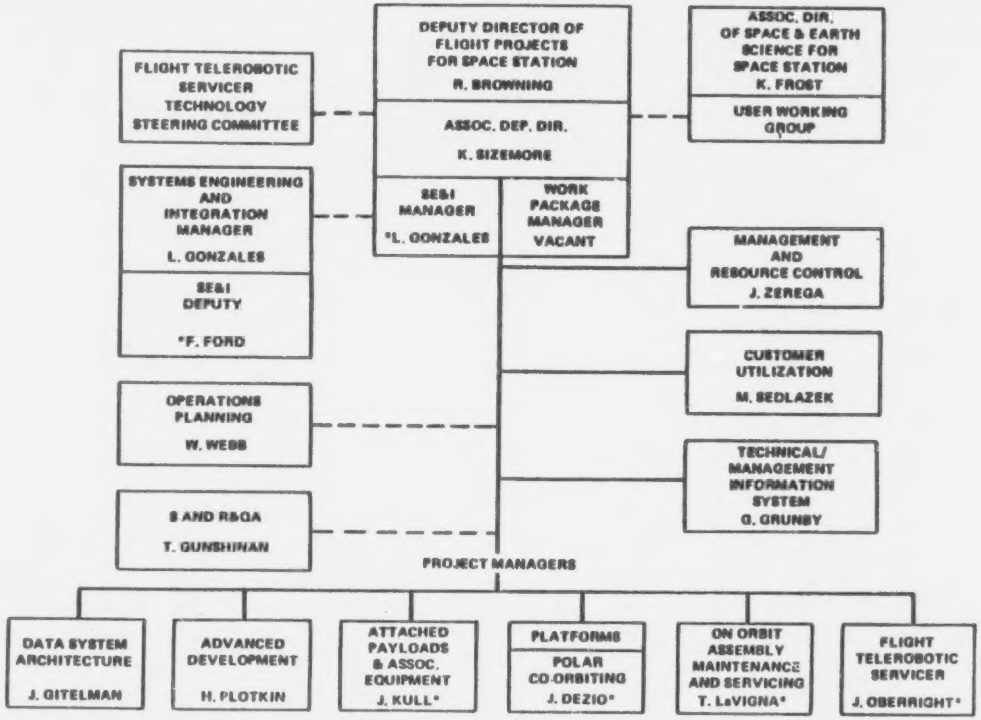

OFFICE OF SPACE STATION
OFFICE OF AERONAUTICS AND SPACE TECHNOLOGY
GSFC SPACE STATION OFFICE
FTS PROJECT OFFICE
OFFICE OF AERONAUTICS AND SPACE TECHNOLOGY
GSFC DIRECTORATES
NATIONAL BUREAU OF STANDARDS
OFFICE OF COMMERCIAL PROGRAMS
JSC
LaRC
MSFC
WORK PACKAGE-3 PRIME CONTRACTOR
JPL
FTS CONTRACTOR
LeRC

Figure 7. FTS Management Interfaces

GSFC SPACE STATION ORGANIZATION


FLIGHT TELEROBOTIC SERVICER TECHNOLOGY STEERING COMMITTEE
DEPUTY DIRECTOR OF FLIGHT PROJECTS FOR SPACE STATION
R. BROWNING
ASSOC. DEP. DIR.
K. SIZEMORE
SE&I MANAGER
*L. GONZALES
WORK PACKAGE MANAGER
VACANT
ASSOC. DIR. OF SPACE & EARTH SCIENCE FOR SPACE STATION
K. FROST
USER WORKING GROUP
SYSTEMS ENGINEERING AND INTEGRATION MANAGER
L. GONZALES
SE&I DEPUTY
*F. FORD
MANAGEMENT AND RESOURCE CONTROL
J. ZEREGA
CUSTOMER UTILIZATION
M. SEDLAZEK
OPERATIONS PLANNING
W. WEBB
TECHNICAL/ MANAGEMENT INFORMATION SYSTEM
G. GRUNBY
S AND R&QA
T. GUNSHINAN
PROJECT MANAGERS
DATA SYSTEM ARCHITECTURE
J. GITELMAN
ADVANCED DEVELOPMENT
H. PLOTKIN
ATTACHED PAYLOADS & ASSOC. EQUIPMENT
J. KULL*
PLATFORMS
POLAR CO-ORBITING
J. DEZIO*
ON ORBIT ASSEMBLY MAINTENANCE AND SERVICING
T. LaVIGNA*
FLIGHT TELEROBOTIC SERVICER
J. OBERRIGHT*

*ACTING

Figure 8. FTS Project within the GSFC Space Station Organization

Table 1. Roles of NASA Centers

GODDARD SPACE FLIGHT CENTER

PROVIDE OVERALL FTS PROGRAM MANAGEMENT

TECHNOLOGY ELEMENT

- ESTABLISH AND MANAGE A PROGRAM TO ASSESS, INTEGRATE AND TEST ROBOTICS TECHNOLOGY DEVELOPMENT PRODUCTS AS APPLIED TO FTS
- DEVELOP AND INTEGRATE FUNCTIONAL REQUIREMENTS AS REQUESTS FOR FUTURE TECHNOLOGY DEVELOPMENT
- COORDINATE WITH THE NASA OAST
- COORDINATE WITH THE NASA OFFICE OF COMMERCIAL PROGRAMS
- ESTABLISH AND PARTICIPATE IN FORUMS TO TRANSFER TECHNOLOGY TO INDUSTRY AND UNIVERSITIES

FLIGHT DEMONSTRATION ELEMENT

- PROVIDE DEMONSTRATION FLIGHT SYSTEM
- CONDUCT TEST AND VERIFICATION OF FLIGHT HARDWARE AND SOFTWARE
- PROVIDE SHUTTLE PAYLOAD CARRIER AND DEMONSTRATION TEST HARDWARE AND SOFTWARE
- DEVELOP ROBOTIC OPERATIONAL PROCEDURES
- INTEGRATE AND DISSEMINATE ENGINEERING DATA RESULTS TO THE GROUND ELEMENT, WORK PACKAGE-3 (WP-3) CONTRACTOR, AND TECHNOLOGY DEVELOPMENT ORGANIZATIONS

SPACE STATION FLIGHT SYSTEM ELEMENT

- DEFINE, MANAGE, AND IMPLEMENT THE DEVELOPMENT PROGRAM FOR THE FTS
- PROVIDE CONTINUING FOCUS ON SAFETY, RELIABILITY, AND QUALITY ASSURANCE
- MANAGE CONTRACTOR DESIGN, DEVELOPMENT, TEST AND EVALUATION ACTIVITIES TO PROVIDE ENGINEERING, FLIGHT HARDWARE, SOFTWARE, AND SUPPORT SUBSYSTEMS
- PROVIDE FUNCTIONAL REQUIREMENTS, OPERATIONAL CONCEPTS, VERIFICATION OF SYSTEM CAPABILITIES, AND MOCKUPS FOR OTHER WP-3 ELEMENTS
- PROVIDE INTERFACE SIMULATORS AND/OR HARDWARE AND SUPPORT INTERFACE TESTING FOR OTHER WP-3 ELEMENTS
- PROVIDE OPERATIONS AND SUSTAINING ENGINEERING
- IMPLEMENT GROWTH PROGRAM

GROUND SYSTEM ELEMENT

- PROVIDE AND OPERATE THE ROBOTICS TEST AND VERIFICATION LABORATORIES
- ESTABLISH AND COORDINATE THE NETWORK OF GROUND SYSTEMS LABORATORIES FOR ROBOTICS
- EVALUATE APPLICATIONS OF ADVANCE TECHNOLOGY FOR SPACE STATION
- ESTABLISH AND MAINTAIN A DATABASE FOR APPLICATION OF ROBOTICS TECHNOLOGIES

JET PROPULSION LABORATORIES

TECHNOLOGY ELEMENT

- PROVIDE FOCUS FOR THE ROBOTICS TECHNOLOGY DEVELOPMENT FOR THE NASA OFFICE OF AERONAUTICS AND SPACE TECHNOLOGY
- PROVIDE ROBOTIC RESEARCH HARDWARE AND CONTROL SYSTEM SOFTWARE INCLUDING SMART END EFFECTORS, HAND CONTROLLERS, OAST DEMONSTRATION SYSTEM SOFTWARE, AND MODIFIED SOFTWARE FOR LaRC HARDWARE CONTROL
- PROVIDE ADVANCED TECHNOLOGY COMPONENTS
- DEVELOP FUNCTIONAL REQUIREMENTS FOR FUTURE TECHNOLOGY DEVELOPMENT
- PARTICIPATE IN TECHNOLOGY TRANSFER FORUMS

JOHNSON SPACE CENTER

TECHNOLOGY ELEMENT

- DEVELOP FUNCTIONAL REQUIREMENTS FOR FUTURE TECHNOLOGY DEVELOPMENT
- PARTICIPATE IN TECHNOLOGY TRANSFER FORUMS
- PROVIDE FOCUS FOR HUMAN ROLE IN ROBOTICS TECHNOLOGY

FLIGHT DEMONSTRATION ELEMENT

- PARTICIPATE IN PREFLIGHT SYSTEM ANALYSIS, TEST, AND INTEGRATION
- MODIFY SHUTTLE HARDWARE FOR SMALL PAYLOAD ACCOMMODATION (NON-RMS)
- PROVIDE HUMAN FACTOR REQUIREMENTS FOR HARDWARE DEVELOPMENT AND OPERATIONS
- CONDUCT CREW TRAINING ACTIVITIES
- CONDUCT STS FLIGHT OPERATIONS
- PROVIDE HUMAN FACTOR SAFETY ANALYSIS

SS FLIGHT SYSTEM ELEMENT

- PROVIDE FUNCTIONAL REQUIREMENTS, OPERATIONAL CONCEPTS, VERIFICATION OF SYSTEM CAPABILITIES, AND MOCKUPS FOR WP-2 ELEMENTS
- PROVIDE INTERFACE SIMULATORS AND/OR HARDWARE AND SUPPORT OF INTERFACE TESTING AND VERIFICATION FOR WP-2, STS RMS, AND MSC
- VERIFY THE MAN-MACHINE INTERFACE
- PROVIDE SUPPORT TO OPERATIONS AND SUSTAINING ENGINEERING
- PROVIDE HUMAN FACTOR REQUIREMENTS FOR HARDWARE DEVELOPMENT AND OPERATIONS
- PROVIDE HUMAN FACTOR SAFETY ANALYSIS

GROUND SYSTEM ELEMENT

- PROVIDE AND OPERATE SS AND STS INTEGRATION LABORATORIES FOR ROBOTICS

KENNEDY SPACE CENTER

FLIGHT DEMONSTRATION ELEMENT

- CONDUCT LAUNCH PREPARATION AND INTEGRATION

SS FLIGHT SYSTEM ELEMENT

- CONDUCT LAUNCH PREPARATION AND INTEGRATION

LANGLEY RESEARCH CENTER

TECHNOLOGY ELEMENT

- DEVELOP FUNCTIONAL REQUIREMENTS FOR FUTURE TECHNOLOGY DEVELOPMENT
- PARTICIPATE IN TECHNOLOGY TRANSFER FORUMS
- PROVIDE ORNL-DEVELOPED TELEOPERATOR SET INCLUDING MASTER CONTROLS AND SLAVE ARMS
- PROVIDE ADVANCED TECHNOLOGY COMPONENTS

SS FLIGHT SYSTEM ELEMENT

- PROVIDE GUIDELINES FOR ENABLING EVOLUTIONARY GROWTH AND REVIEW IMPLEMENTATION

LEWIS RESEARCH CENTER

TECHNOLOGY ELEMENT

- DEVELOP FUNCTIONAL REQUIREMENTS FOR FUTURE TECHNOLOGY DEVELOPMENT
- PARTICIPATE IN TECHNOLOGY TRANSFER FORUMS

SS FLIGHT SYSTEM ELEMENT

- PROVIDE FUNCTIONAL REQUIREMENTS, OPERATIONAL CONCEPTS, VERIFICATION OF SYSTEM CAPABILITIES, AND MOCKUPS FOR WP-4 ELEMENTS
- PROVIDE INTERFACE SIMULATORS AND/OR HARDWARE AND SUPPORT OF INTERFACE TESTING FOR WP-4 ELEMENTS

MARSHALL SPACE FLIGHT CENTER

TECHNOLOGY ELEMENT

- DEVELOP FUNCTIONAL REQUIREMENTS FOR FUTURE TECHNOLOGY DEVELOPMENT
- PARTICIPATE IN TECHNOLOGY TRANSFER FORUMS

SS FLIGHT SYSTEM ELEMENT

- PROVIDE FUNCTIONAL REQUIREMENTS, OPERATIONAL CONCEPTS, VERIFICATION OF SYSTEM CAPABILITIES, AND MOCKUPS FOR WP-1 ELEMENTS
- PROVIDE INTERFACE SIMULATORS AND/OR HARDWARE AND SUPPORT OF INTERFACE TESTING FOR WP-1 AND OMV

GROUND SYSTEM ELEMENT

- PROVIDE AND OPERATE OMV OPERATIONS SIMULATOR LABORATORY

PROCUREMENT APPROACH

The contract for the Flight Telerobotic Servicer will be openly competed and managed by GSFC separately from the remainder of the Phase C/D procurement for Work Package-3. A "Cost Plus Award Fee" type of contract is envisioned. The products of the contract will be furnished to the Work Package-3 prime contractor, who will be responsible for integration of the Flight Telerobotic Servicer with the Work Package-3 elements.

SCHEDULE

The NASA Flight Telerobotic Servicer Program will:

- Provide an early demonstration of telerobotic capabilities
- Deliver a Space Station Program element to enhance productivity and safety
- Establish a ground system to support continued evolution

The overall program schedule leading to a Demonstration Flight on Shuttle in 1991 and an FTS available for the Space Station First Element Launch is shown in Figure 9.

The FTS Program will also:

- Accelerate the application of robotics technology to flight programs
- Provide a source of applied technology for industry and university use

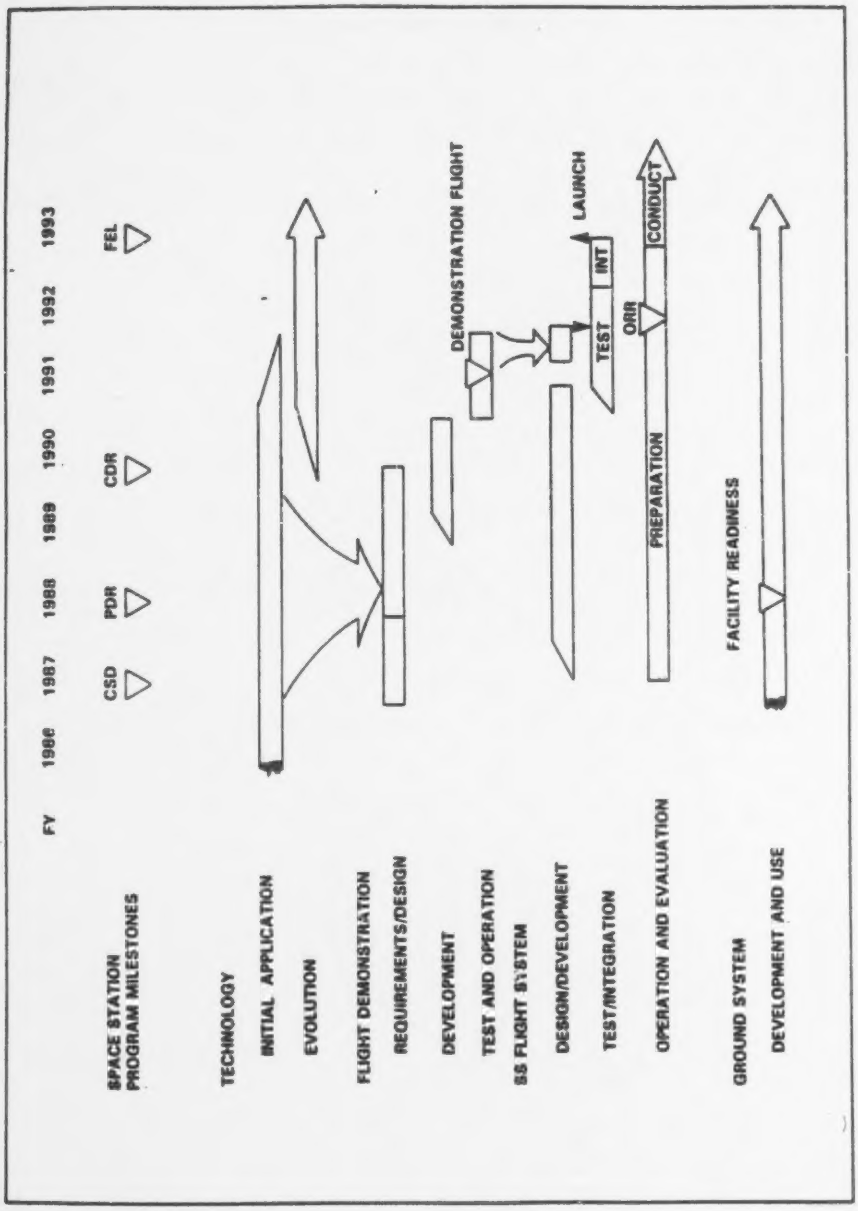


Figure 9. Flight Telerobotic Servicer Program Schedule

ACRONYMS

A&R	Automation and Robotics
ATAC	Advanced Technology Advisory Committee
DDT&E	Design, Development, Test and Evaluation
DOTS	Dynamic Overhead Target Simulator
EVA	Extra-Vehicular Activity
FEL	First Element Launch
FTS	Flight Telerobotic Servicer
FY	Fiscal Year
GSFC	Goddard Space Flight Center
IVA	Intravehicular Activity
JPL	Jet Propulsion Laboratory
JSC	Johnson Space Center
KSC	Kennedy Space Center
LaRC	Langley Research Center
LeRC	Lewis Research Center
MDF	Manipulator Development Facility
MSC	Mobile Servicing Centre
MSFC	Marshall Space Flight Center
MSS	Mobile Servicing System
NASA	National Aeronautics and Space Administration
NBS	National Bureau of Standards
NSTS	National Space Transportation System
OAST	Office of Astronautic and Space Technology
OMV	Orbital Maneuvering Vehicle
ORNL	Oak Ridge National Laboratory
ORU	Orbital Replacement Unit
RMS	Remote Manipulator System
SS	Space Station
SSO	Space Station Office
STS	Space Transportation System
WP	Work Package

SUBCOMMITTEE RECESS

Senator MIKULSKI. The subcommittee will stand in recess until tomorrow, April 10, in room SD-124, where we will continue to take testimony.

[Whereupon, at 11:35 a.m. Thursday, April 9, the subcommittee was recessed to reconvene at 10 a.m. Friday, April 10.]

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT-INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1988

FRIDAY, APRIL 10, 1987

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10 a.m. in room SD–124, Dirksen Senate Office Building, Hon. William Proxmire (chairman).

Present: Senators Proxmire and Garn.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

STATEMENT OF JAMES C. FLETCHER, ADMINISTRATOR, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ACCOMPANIED BY:
- C. THOMAS NEWMAN, ASSOCIATE ADMINISTRATOR
- DALE MYERS, DEPUTY ADMINISTRATOR
- RICHARD TRULY, ASSOCIATE ADMINISTRATOR FOR SPACE FLIGHT
- SAMUEL KELLER, DEPUTY ASSOCIATE ADMINISTRATOR FOR SPACE SCIENCE AND APPLICATIONS
- ANDREW STOFAN, ASSOCIATE ADMINISTRATOR FOR SPACE STATION
- RAYMOND COLLADAY, ASSOCIATE ADMINISTRATOR FOR OFFICE OF AERONAUTICS AND SPACE TECHNOLOGY
- BOB ALLER, ASSOCIATE ADMINISTRATOR FOR SPACE OPERATIONS
- DR. HARRIET JENKINS

OPENING REMARKS

Senator GARN [presiding]. The subcommittee will come to order.

Dr. Fletcher, we're happy to have you back before the subcommittee today. Senator Proxmire is over on the floor and will be here at approximately 10:30, so he decided he could trust me for half an hour. And frankly, it seems kind of good after 6 years to get my half hour back as chairman of the subcommittee, and unfortunately, it won't last long. If I could approve the budget before Chairman Proxmire comes back I would, but I think I would have a hard time with that, as no other committee member is here.

Dr. FLETCHER. You have the vote, Mr. Chairman.

Senator GARN. Well, by unanimous consent; yes.

Do you have any opening statement you or any of your colleagues wish to make this morning?

Dr. FLETCHER. Not this morning, Mr. Chairman.

BUDGET ESTIMATES

Senator GARN. Dr. Fletcher, a major cost of government programs, seems to me, not only in the last few years in NASA, but in many other areas of government as well is to make clear, on program directions. What I'm speaking of here is we seem to start, stop, decide on a program, we proceed with it and we decide we're going to cut back and start a program, we cancel that.

It seems to me, we too often in the federal government embark 1 year in one direction and the next year in another for a lot of reasons. It usually isn't the intention of the agencies, it's a matter of the budget process we get in either at the OMB level or here at the congressional level, and we find ourselves with budget constraints. It seems to me that that causes a good deal of extra costs. We talked about that yesterday in terms of the space station, and because of budget constraints rather than going with full opt to having it divided into two blocks; although you mentioned that we did have the alternative, obviously, to proceed with any of those options because of the fact that they were phased over a number of years.

It seems to me it certainly is no way to run a railroad and it's a more expensive way to conduct a space program.

And before us we do have your request to proceed with the development of a currently manned space station. Two years ago before we did any really serious analysis of what one would cost, we thought it would cost some $8 billion. After spending these 2 years examining what this unique, and what I consider really truly revolutionary facility ought to be, we now expect it to cost nearly twice that much. Well, frankly, I'm not very surprised as I outlined yesterday, and I certainly don't need to repeat my filibuster of yesterday starting out the session.

If you could, in a very general sense, proceed from where we were talking yesterday about how in an area such as NASA, where we're talking about the edge of scientific discovery, and with very complex machines that have not yet been built. In other words, we have never built a space station before. And so I'm trying to make cost estimates. It's difficult. And that's why I meant what I said that I'm not surprised that it increased.

Can you give the subcommittee some idea of how you do arrive at your budget estimates? How you do try and plan for something that is supposed to be up there several years down the road with components that have not yet been fabricated, and come up with any reasonable cost estimate?

Dr. FLETCHER. Mr. Chairman, I can start off on that. As you know, we're involved in a very high technology program. Almost every one of NASA's programs is at the cutting edge of technology. It's all R&D. It's not like building a road or a building or a bridge. It's state-of-the-art technology.

However, we're getting reasonably good at estimating costs of R&D programs with NASA. Most of our programs, unless there's an accident like we just had, come in approximately as calculated.

SPACE STATION BUDGET ESTIMATE

However, in the case of the space station I would like to correct for the record, the cost really, leaving out inflation, has only increased by about 50 percent, something like $8 billion was an early estimate clear back in 1983 actually, we call it 1984 dollars, but the first estimate was completed in 1983 before the State of the Union message was made and that has moved up to something like $13 billion, if I am in the right ballpark.

So, that's a typical situation in an R&D program. If you will trace the history of a lot of our programs, when we first do the back of the envelope calculations for an R&D program, we generally leave out things that we should have put in there. We are a little bit optimistic sometimes on what we call the allowance for program adjustments [APA], and a lot of other things.

After we've gone through a phase A and a phase B, that tightens up and we have actually made plots which we could supply for the record on some of our programs.

[The information follows:]

COMPARISON OF PROGRAM COST AND ESTIMATES

A comparison of the final program costs to the estimates made just prior to initiation of the development phases (C/D) indicates the following:

PROGRAMS WITH LESS THAN 10-PERCENT GROWTH

Pioneer F&G
Mariner Venus Mercury 1973
International Ultraviolet Explorer
International Sun-Earth Explorer
Heat Capacity Mapping Mission
Landsat-C
Stratospheric Aerosols and Gas Experiment
Nimbus-G
Pioneer Venus
Solar Maximum Mission
Dynamics Explorer

PROGRAMS WITH GROWTH BETWEEN 10 PERCENT AND 20 PERCENT

Viking 1975
Skylab
Seasat-A
High Energy Astronomical Observatories
Tiros-N
Voyager
Magsat
Earth Radiation Budget Satellite

PROGRAMS WITH GROWTH BETWEEN 20 PERCENT AND 35 PERCENT

Space shuttle
Applications Technology Satellite-F
Orbiting Solar Observatory-1

Small Astronomy Satellites A–C
Atmosphere Explorers C–E
Earth Resources Technology Satellite A&B
Nimbus E&F

PROGRAMS WITH GROWTH OVER 35 PERCENT

Landsat–D (46 percent)
Infrared Astronomical Satellite (118 percent)
Synchronous Meteorological Satellites A&B (90 percent)

COST ESTIMATE A FUNCTION OF TIME

Dr. Fletcher. Our estimate of the cost of a program was a function of time. Quite often the first estimate, the back of the envelope estimate, was 50 or 60 percent higher than the final estimate, maybe 40 percent higher than the estimate at the end of phase B, but that's the nature of an R&D program. You make an early estimate and then after you've got your contractors on board and enough people to deal with the problem, and you have thought of all the things that you can think of and added a reasonable allowance for program adjustments you come up with a much firmer estimate.

So, the $13 billion has a lot less uncertainty in it than the $8 billion did in the early estimates. On top of that, and not included in this estimate, we always assume that inflationary costs for R&D is the same as say, the wholesale price index or the consumer price index, or something like that, and it's not always the case for R&D quite often.

In fact, it was especially true in the last 10 years, R&D costs increased much faster than the consumer price index. So, inflation isn't always properly accounted for, but we try our best by quoting the numbers in constant dollars.

And having said all that, I think we can turn to either Mr. Myers or Andy Stofan and they will give you details of what, in fact, increased from that earlier estimate; how we got from $8 to $13 billion in small increments. I don't have it in front of me, but you probably have it in your head, you have gone over it so many times.

DEVELOPMENT COST OF THE SPACE STATION

Mr. Stofan. Mr. Chairman, going back to the $8 billion estimate which was made in 1983 or the beginning of 1984. The estimate was on a space station configuration that had very, very little money, time, or contract involvement behind it. And, in fact, today, the two space station configurations we have today do not look like the ones at that time at all.

The space station evolved over a period of 3 or 4 years to its present configuration. As it was evolving and changing, as we made more and more studies and got more and more contractors involved and began to pin down what we wanted, the station changed.

However, the $8 billion estimate was kept constant over that period of time. There was not a real bottoms up cost analysis made until we went through the exercise last fall where we had a group come in and essentially determine where we stood on the program. It took 90 days, and they went back and looked at the configuration and assembly sequence, modified the configuration somewhat, and modified the assembly sequence by quite a bit. It solved the APA problem both in maintenance and assembly.

We then had a baseline and said, "Let's go back and make a bottoms up cost estimate." We went back to the NASA centers and contractors and spent approximately 5 or 6 months developing a very detailed cost estimate with a total program cost of $13 billion.

At this time, I would like to expand upon the three areas which were affected. First, the value of the hardware changed. The contracts increased by approximately $1 billion. Even though the value of the contracts increased, the basic hardware did not change significantly.

Second, I think the largest increase can be attributed to the support of the infrastructure; that is, the work carried out directly at the centers, not through the prime contractors. We call this nonprime. For example, at JSC, we have to build a mission control center and astronaut training facilities. We also have test beds at the various centers that simulate the systems. It is this basic infrastructure that is necessary to support the program. This is NASA's institutional responsibility, not the prime contractor. This part of the program was originally estimated to be a given percent of the $8 billion.

When we reevaluated the original estimates and conducted a detailed analysis, it turned out that this area increased by approximately $3 billion. Last fall was the first time that a detailed analysis of this was ever completed.

Third, we increased the reserves by about 15 percent. A 15-percent increase in the reserves was added to take into account two different estimates that surfaced. Given some of the risks of assembling the station on orbit for the first time while never being able to fully assemble and check out the integrated system on the ground, we recommended a modest increase in the reserves which resulted in an increase of several million dollars. These are the three major areas which contributed to the cost increase.

I now believe we have a program that has been thoroughly assessed from a technical point of view relative to what it is and what we want to do. And I think we understand the configuration. I believe that with the reserves currently identified, we have a reasonable chance of developing this configuration with the currently identified program.

NASA'S R&D RECORD

Dr. **Fletcher**. Mr. Chairman, I would like to add one other thing, which I may have forgotten to mention.

We are dealing with an R&D program here, and NASA has an excellent record in terms of R&D programs, as well as in comparison to any other agency of the government. I think you can compare our record on purely R&D programs with other agencies in the government, and GAO has done so from time to time, and it holds up pretty well.

SPACE SHUTTLE COSTS

Yesterday, I think someone mentioned the space shuttle return to costs. Believe it or not, the space shuttle came in under the estimated target on the development costs. We estimated the costs—I happen to remember that one very well—for the space shuttle after phase B was completed at, as I recall, $5.25 billion. They thought it was too many figures but that was our estimate in 1971 dollars. I think when you adjust the 1971 figure with the appropriate inflations we came in under the estimate.

Unfortunately, however, we should have had a little more reserve because there are a lot of things we should have done on the space shuttle that weren't done so we could make our budget. Nevertheless, we met that quite closely. Nearly every other program in NASA has had this same kind of experience. The early estimates were a little flaky, but by the time the phase B estimates were completed, they were right on target.

There were exceptions; the space telescope was one of the exceptions that I can remember. However, all the programs that were scheduled to fly on the shuttle hve been delayed due to the accident. Naturally, they're going to increase in cost. However, most of NASA's R&D programs have had fairly good cost estimates once the phase B was complete.

Now, having said that, we are learning how to estimate operational costs better. We missed by a fair margin on estimating the operational costs for the shuttle, but we're not going to do that again on the space station; we have learned a lot from estimating operational costs, and that's the reason why we have a major effort planned on space station operations.

So, by and large, even though it's always a shock when you change your estimate say from $8 billion to $13 billion, it is not unusual for an R&D program. Granted the increase is a little higher than normal for NASA. We usually do better between our back-of-the-envelope estimate and our phase B estimate.

Nevertheless, I'll match our cost estimating against any other government agency. I think other people have done that and it holds up very well.

As I've talked, this is another reason why the cost increases, especially in R&D programs.

Senator GARN. Well, the reason I want to pursue this in greater depth today is because I understand what you're saying, and I tried to make the point very strongly yesterday on how difficult it is in R&D programs at the cutting edge of technology to make reasonable estimates. I made the comparisons with other governmental programs, which are not leading edge technology programs at all; they're common everyday things that we manufacture from houses to automobiles to you name it, the incredible cost overruns.

In the 12 years that I have been here, which is after the estimates were made for the space shuttle, I don't think anyone in their wildest estimations could have believed what the cost of running Congress is today compared to what it was 12 years ago and no one would have believed the incredible amount of staff increases and cost increases to well over a $1 billion in Congress.

And so, in any area that you want to look at in the 12 years that I have been in the U.S. Senate, every estimate has been wrong and virtually every estimate in every area of government has been vastly understated.

I can remember just 6 years ago when the estimate for the budget deficit for fiscal year 1981, I believe, was going to be $45 billion, and we missed by a little bit, like about double, and we reached budget deficits in the excess of $220 billion, and only 25 years ago the entire country was run and defended for $106 billion.

What I'm trying to do, and although it seems large, and I would suggest that no matter how sincere you are, your $13 billion estimate will be wrong and none of us are going to be around here when we find that out. But I would be willing to bet that it is much higher than $13 billion, and I want that in the record now, so that we don't have any great shocks or surprises when it comes around. Somebody can read the record of the subcommittee and say, well, they knew it was going to take place.

In other words, I think we ought to be realistic about it. Because what we get trapped in is, OMB obviously doesn't understand the background. We talked about them being bean counters yesterday. And all they see is, good heavens, our numbers trying to fit together in a budget, they said $8 billion and it's $13 billion, and they don't know anything about the cutting edge technology or a policy in the future or care for that matter. Whether there's a space station up there in the mid-1990's, they're down there with their green eye shades and black arm bands counting their beans or whatever else they count and they're doing it to all the agencies without setting any policy determinations.

So I appreciate the more detail, and see if we can get some understanding as to that shock that you get when OMB and the press pick it up, and then Congress pick it up and says, "Oh, good heavens, we can't tolerate that. So, we've either got to slow down, we have to stretch out, we've got to build a lesser space station."

It seems to me in some of these programs we have got to be more realistic at the outset, so that the shock isn't there when the price does go up in some of these programs, when it's so difficult to make accurate estimates.

There's something else, Dr. Fletcher, that I don't know how to get the story out. In other words, what I'm trying to say here, if we decide as a national policy that we need a space station and it's beneficial to this country, then we should proceed and build it as rapidly and as efficiently as possible. Don't misunderstand, because we set a goal.

BENEFITS FROM SPACE

I'm not sitting here saying that regardless of what it costs that we should go ahead and do it. We should do it as efficiently as we can and as rapidly as we can. But what Congress does not understand or what the American public does not understand is the benefits that have come. I have talked about it a little bit yesterday. Somehow NASA needs to do a much better job. I don't know how to recommend that because I've been trying for several years to let people know the benefits.

I've seen estimates as low as $6 returned in the private sector for every $1 we spend on space, and as high as $9 or $10. Now, I don't know where it is, and it doesn't make much difference. There aren't too many government programs, and even if you want to cut that in half and say you get $3 back in the private sector for every $1 we spend. I think in selling the space station, you need to come up with a story of what will be the benefits of a space station.

I don't know how many times I've been asked, particularly since I flew in space, why we waste money in space, and my standard answer has been, we have never spent a dime in space and I didn't take a credit card or a wallet with me, there were no stores, there was nothing to buy out there, and every dime is spent here on Earth some place in virtually every state in this country and a lot of foreign countries. Now, the space budget stays on Earth, it isn't in competition with Earth-bound budgets.

IMPORTANCE OF INFORMING THE PUBLIC

But I would suggest, if you can very briefly today, but more importantly on a longer range basis present a glossy brochure or what, start telling us and the American people, whether it's $13 billion or $16 billion, what we are going to get back for that investment in terms of science and benefit.

We can look back and talk about a pacemaker. Very few people, as common as that is, knows that a pacemaker has saved lots of people's lives, because of their heart problems and being able to correct it with that kind of device.

Now, can you at least briefly tell us what you expect to get out of a space station for the $16 or $13 billion, excuse me, $16 billion is my off-the-top-of-my-head scientific estimate.

Dr. FLETCHER. Mr. Chairman, you're absolutely on track on the business of our not really dealing with the real benefits from space. We have not done a good job of explaining that to the American people. And I don't want to be defensive about it, but we just haven't done it.

SPINOFFS

Let me give you some caveats. We have been able to trace something like 10,000 items, articles, pieces of equipment, if you like, that have been a direct result of the space program. I don't know whether it's 10,000 or 8,000, but a large number. Needless to say, it's rather difficult to describe 10,000 items to the American people. So we try to identify the major ones, especially those that deal with something everybody knows about, and we publish annually a brochure entitled "Spin-Offs." "Spin-Offs 1986" highlights some of the major technologies and provides the reader with a feeling of what those benefits are, and there's a large number of them.

In fact, no matter where you go or where I go, I look at the label on the instrument or the item and ask, "Hey, who built that." If it's a medical instrument, 8 times out of 10 it is some organization that derived the technology directly from a space program.

We, being scientists, decided to quantify that spinoff ratio when I was here several years ago. We hired the best economists we could find and put three different groups to work on it, and, in fact, some are the elitest economists in the country, the econometricians. As you've pointed out, economics is not an exact science, but nevertheless, we did the best we could.

The estimates at that time were based on the Apollo program because that's what we had in front of us. The estimates at that time for return on investment were approximately $5 to $7 return for every $1 invested. Well, that's a back-of-the-envelope guess, but nevertheless, that's the best you can do.

The President, by the way, has told me several times, restating your sentiment, that we really ought to make available to the American people what they're getting out of the space program. We plan to do that in the next year. We have a number of programs ready to go, and you will begin to see some of that in the upcoming 12 months. However, I agree with you that we've got to do a better job.

Senator GARN. Well, I would suggest that this information be made available, not only to the subcommittee but to every Member of Congress. Those that are involved on other committees are tied up in agriculture or whatever and are really not aware. I was just off the top of my head suggesting agriculture, that members of the Agriculture Committee might be supplied with all the agriculture benefits that have come, the crop yields, bug infestations, topography, that have helped agriculture all over the world, too. There are so many things that are indirect that help in virtually every area that we participate in.

Dr. FLETCHER. Mr. Chairman, we haven't attempted that but it's a good idea. Let's see if we can't break out some of these 10,000 items or so into categories that fit into areas of interest; for example, agriculture or health. We'll pursue this further.

Senator GARN. Well, the point I'm trying to make, like Everett Dirksen once said, a billion here and a billion there, and pretty soon it adds up to real money.

So, there's no doubt that $13 to $16 billion is a lot of money. And I'm just trying to say let's find out so we can educate people on what they are getting for their money. It's easier to make a decision than whether they think it's worth voting for.

BENEFITS FROM AERONAUTICS RESEARCH

I would also like to explain another area briefly, if you could, that I have found that people don't understand at all, because they understand NASA as a space agency, but they have missed the first stage, aeronautics. Most people are totally unaware that a good part of NASA's budget goes for aeronautic research, super critical wings, high bypass engines, and all sorts of things, crash safety programs, that they are absolutely unaware of. I think that's another area you could explain briefly here, but also do a better job of explaining how many U.S. airliners are flying the 757 and 767 that came from NASA's work.

I realize I'm biased. I get accused of that by the press all the time, but facts are facts. For me to stand up here and state opinions may be suspect, but facts are facts, and again, NASA in this area has really done a very poor job in telling the American public and Congress the benefits that are received from the dollars that we spend in research and development in the aeronautical area as well.

Dr. FLETCHER. Mr. Chairman, on the aeronautics, that's a different kind of problem, because there you can point directly to the benefits. You can say, look at that airplane, it has got the NASA winglets on it, or its got the super critical wing, or it's got the high bypass ratio engine. Anybody who knows about airplanes already knows that most of those technologies came from NASA.

Senator GARN. But the passenger on that 757 doesn't know it and the average Congressman or Senator does not know that those winglets came from NASA.

Dr. FLETCHER. Quite right. I was going to say, anybody who knows anything about airplanes knows it; the average public doesn't. We ought to be able to do a better job, because that's a direct benefit. And by the way, it's not true only for the commercial aircraft, it's true of all military aircraft as well. People don't realize that the only reason we're able to fly supersonic in our military aircraft is because of the rule developed by our predecessor agency, NACA, back in the 1950's. We ought to do a better job of explaining that to the public, not just to people who know about airplanes. You're quite right.

BENEFITS OF EXPENDITURES SPENT ON R&D

Senator GARN. Well, I see, for an example, is there any way you can make an estimate, just in one area? Sometimes when they talk about 5 or 6 or 7 or 8 or 9 to 1, that isn't too meaningful either. But most of us were back here in 1973 and 1974 when we were waiting in lines to buy fuel and we talked about becoming energy independent. I wonder if there's any way you could make a computer estimate of how much fuel has been saved as a result of winglets, super critical wings, high bypass engines, and other technologies, so we can start showing direct benefits of expenditures spent on NASA research and development that show up, not as a saving in government, but as a direct saving to every person because of lower fuel cost, less fuel consumption, less reliance on OPEC as a result of those kinds of technologies.

Dr. FLETCHER. Mr. Chairman, we can certainly supply that for the record, but Dr. Colladay has already made such studies. In fact, you have listed a significant number of things we have accomplished during the period of the energy shortage and I think you have a very good tabulation of those benefits; don't you?

Dr. COLLADAY. I don't have them with me, but we can provide them for the record, Mr. Chairman.

[The information follows:]

ACEE TECHNOLOGY AUDIT TRAIL

On April 10, 1987, during the testimony of Dr. Fletcher before the Senate Committee on Appropriations, Subcommittee on Housing and Urban Development-Independent Agencies, Senator Garn asked for specific success stories on NASA developed aeronautics technology being used by industry. Dr. Colladay agreed to supply the Subcommittee with information on the benefits of NASA developed technologies, and in particular, technologies developed in NASA's Aircraft Energy Efficiency (ACEE) program. The following material is in response to the Subcommittee's request.

In January 1975, the Senate Committee on Aeronautical and Space Sciences, responding to the OPEC oil embargo of 1973-1974 and the rapidly increasing U.S. dependence on foreign oil, requested NASA to develop a program to improve aircraft energy efficiency. The resulting NASA Aircraft Energy Efficiency (ACEE) program was begun in fiscal year 1976. The ACEE program had one element of near-term, product improvement related research and five elements of a more long-range research nature. The near-term product improvement element was the Engine Component Improvement program, and the more far reaching elements were the Energy Efficient Engine, Energy Efficient Transport, Composite Primary Aircraft Structures, Laminar Flow Control, and Advanced Turboprop programs.

The Engine Component Improvement (ECI) program had the objectives to: (1) improve the performance and performance retention characteristics of engine components that would reduce the fuel consumption of current engines for application through introduction in new production engines and the retrofit of existing engines in the 1980-1982 time period, and (2) provide additional technologies which could be used to minimize the performance degradation of current and future engines. The technologies developed in the ECI program have been incorporated into later versions of the Pratt & Whitney JT8D and JT9D engines and the General Electric CF6 engine and have been verified by the engine manufacturers to have improved the efficiency of these engines by about 6 percent. These engines are currently used to power the B-747, B-767 and MD-80 aircraft. Based on the current fleet of these aircraft, it is estimated that the ECI technology will save approximately 250 million gallons of fuel in 1987.

Because of the high likelihood that the ECI technology advancements would be incorporated in near-term derivative commercial transport engines, NASA had recoupment provisions in the contracts with industry for 1 percent of the gross receipts on the sale of parts and engines which incorporated the improved parts derived entirely or substantially from the ECI-funded research, up to the $24.3 million NASA investment. To date the government has recouped almost $7 million from the users of the ECI technology.

The Energy Efficient Engine (EEE) element of the ACEE program was much longer-term in focus than the ECI element. The EEE objective was to develop an advanced technology base that could be used for a new generation of fuel conservative turbofan engines for future commercial transport. The EEE program was conducted from 1977 through 1983 and the technology advances developed in that program have been and are still being incorporated in derivative models of current technology engines or in new energy efficient engines. Dr. M.E. Shank, Director Engineering-Technical, Commercial Engineering of the United Technologies Corporation, Pratt & Whitney Group stated before the U.S. Senate Subcommittee on Science, Technology and Space on March 15, 1983 the following:

> "NASA's Energy Efficient Program, known as EEE, has provided substantiation of many new propulsion technologies. Many of these have been applied to Pratt & Whitney's PW2037 engine, with 37,000 pounds of thrust, now under development at a cost exceeding a billion dollars. When this engine enters service on the Boeing 757 in 1984, it will be the most fuel efficient engine of its type in the world. A major portion of the fuel consumption improvement can be attributed directly to the EEE Program. To illustrate the competitive importance of that improvement, it means that the engine is approximately five to eight percent lower in fuel consumption than its only competitor for the 757, an engine manufactured in Great Britain. In addition, the EEE technology is also being applied to the new family of engines, with a thrust range of 48,000 to 60,000 pounds, to be certificated in 1986."

The PW2037 did go into service in 1984 and is available along with the original Rolls-Royce engines on the Boeing 757 and has been shown to be 7 percent more fuel efficient than the Rolls-Royce. The PW4000 family of engines, the larger thrust range family Dr. Shank was referring to in his statement, is now in service replacing the Rolls-Royce engines on the Airbus A310 and Boeing 747. The PW4000 engine family has been shown to be 8 percent more fuel efficient on the 747 than the Rolls-Royce engines. Also, because of the EEE technology, the PW4000 family is 12-15 percent more efficient than the older Pratt and Whitney JT9D-7R4 engine. Similarly, the EEE technology advancements have been applied to derivative engines developed by the General Electric Company and the technology is being applied in the core of the new engine being developed for the Unducted Fan (UDF) turboprop propulsion system. Even though the engines using EEE are in limited use in today's U.S. air carrier fleet, these new technology engines are estimated to save 50 million gallons of fuel in 1987.

The objective of the Advanced Turboprop (ATP) element of the ACEE program was to develop technologies for the efficient, reliable, and acceptable operation of advanced turboprop-powered aircraft at jet transport cruise speeds ranging from Mach 0.7 to 0.8. The goal of the ATP program was to achieve a 30-40 percent fuel savings and at least a 5 percent improvement in direct operating cost relative to advanced turbofan engines at equivalent noise and vibration levels of current aircraft. The ATP program was conducted in three phases. The objective of phase I of the ATP program (1978 through 1980) was the development of a fundamental performance data base for thin, swept-tip, multibladed, high-speed propellers through the test and analysis of several small-scale propeller models in wind tunnels at Lewis Research Center and United Technologies Research Center. In phase II of the ATP program the emphasis shifted from small-scale model work to the design, fabrication, and ground test of large-scale (8- to 10- foot diameter) propellers. In phase III of the ATP program (1984 through 1988) large scale propfans are being tested in the full-scale airline flight environment. In this phase NASA has been working very closely with the industry to insure effective technology transfer. Both single-rotating and counter-rotating advanced propeller configurations are being carried through flight test. The Boeing and General Electric Companies have just completed a 42 hour flight test program of a proof-of-concept Unducted Fan (UDF) system mounted on a Boeing 727-100 test aircraft. General Electric is currently building a new small gas generator, based on EEE technologies, and has redesigned the propulsor section for a production UDF engine. General Electric expects an approximate 6,000-engine market for the UDF engine for use on new aircraft to replace older existing transport aircraft such as the Boeing 727's, McDonnell Douglas DC-9's and Boeing 737's. The McDonnell Douglas Company began testing a second UDF demonstrator engine on an MD-80 aircraft in May of this year. Following this test, a United Technologies/Allison 578-DX geared counter-rotating advanced turboprop engine will be mounted on the same MD-80 test aircraft for evaluation scheduled to start in December.

In addition, under the ATP program NASA with Lockheed-Georgia is conducting a 150-hour flight test program of an 8-bladed, 9-foot diameter Hamilton Standard propfan driven by a 6,000-hp Allison Model 501-M78 engine on a Gulfstream 2 test aircraft. The objective of these tests is to obtain detailed information on the structural response of the propfan blades and the noise generated by a propfan installation. NASA developed ATP technology is clearly being transferred quickly to industry. Although the large-scale ground and flight test elements of the program are not demonstrating specific configurations for subsequent development, they are addressing critical technology issues. The ATP technology offers a 20-25 percent fuel savings over turbofan technology. Applying the ATP technology on the new Boeing 7J7 and McDonnell Douglas MD-91 aircraft has the potential for cumulative fuel savings of 5 billion gallons by the year 2010.

The objective of the Energy Efficient Transport (EET) element of the ACEE program was to develop advanced aerodynamics and active controls technologies and expedite early industry application to derivative and future production commercial transport aircraft. The EET program goal was to increase fuel efficiency by 15-20 percent. The advanced technologies included in the EET program are shown in Figure 1. The application of all the technologies could allow the development of new airplanes in the 1990's that are at least 15-20 percent more fuel efficient than those currently in production. There are certain EET technologies that have been clearly transferred to industry. The Boeing 747-400 and 7J7 and the McDonnell Douglas MD-11 will incorporate winglets. Pictures of these aircraft are shown in Figures 2, 3, and 4 respectively. The winglet is a technology developed by the EEE program and was demonstrated to reduce drag by 5.5 percent by flight tests on a KC-135 and 2 percent on a DC-10. A second technology that was developed in the EET program and has already been transferred directly to industry was the Wing Load Alleviation (WLA) system used on the Lockheed L-1011-500. The WLA system uses an active control system to operate the outboard ailerons during high-speed flight to reduce structural loads on the wing during maneuvering and gust penetration. The technology developed for the WLA system in the EET program was used on the L-1011-500 to obtain a 3 percent fuel saving. To date 50 of these aircraft have been manufactured and are in service.

The objective of the Composite Primary Aircraft Structures (CPAS) element of the ACEE program was to provide the technology readiness for commercial transport manufacturers to commit to the incorporation of composites in future aircraft. The composite components designed and developed in the CPAS program demonstrated significant weight savings (20-25 percent), and test results on full scale articles were in good agreement with predicted levels. The components selected for this program were direct replacements for existing metallic structures on production aircraft. However, even though these components demonstrated significant improvements in performance, they were not cost competitive for replacement on production aircraft. Nevertheless, the Boeing 757 and 767, McDonnell Douglas MD-80, and V-22 aircraft have all benefitted from the composite structure technology demonstrated in the CPAS program. Boeing currently plans an extensive use of composites on the 7J7 for both the primary and secondary structures, as shown in Figure 5.

The objective of the Laminar Flow Control (LFC) element of the ACEE program was to develop and demonstrate a practical, reliable, maintainable boundary layer control system that could provide skin friction drag reduction resulting in fuel savings of 20-40 percent in future transport aircraft. Skin friction drag occurs when a fluid moves past a solid surface, and a thin layer of fluid (air) develops adjacent to the surface where the frictional forces tend to retard the motion of the fluid. This boundary layer generally exists in one of three states: laminar, in which the fluid particles travel along well-ordered nonintersecting paths; transitional, in which fluid disturbances become amplified, causing the smooth "layered" flow to become disrupted, with some mixing of particles between layers; and turbulent, in which fluid particles from adjacent layers become totally mixed. It has been demonstrated that the growth of these disturbances can be controlled and that a turbulent boundary layer state can be prevented by removing a small amount of fluid in the boundary layer adjacent to the surface through suction. This is termed laminar flow control. On commercial aircraft now in use, the boundary layer is virtually always turbulent. During cruise, about half of the engine power needed to maintain level flight is required to overcome the aircraft skin friction drag. Laminar flow control can reduce the skin friction drag substantially. During the LFC program, one of the most significant accomplishments was determining that laminar flow could be obtained over much of the wing surface by removing the boundary layer with suction only over a portion near the leading edge of the wing and obtaining natural laminar flow over much of the remaining wing surface by having the proper airfoil shape and surface condition. This is termed hybrid laminar flow control. NASA has continued research on laminar flow following the ACEE program and is currently planning large scale flight tests of hybrid laminar flow control on a section of the wing of a transport aircraft. This hybrid laminar flow flight evaluation is a three year program that will be conducted jointly with the Air Force beginning late in fiscal year 1987.

In summary, the NASA Aircraft Energy Efficient Program has provided the technology for major savings in transport aircraft fuel usage. Engine Component Improvement technology is being incorporated in every commercial transport engine manufactured in the U.S. today. The technology will save approximately 250 million gallons of fuel in 1987. The Energy Efficient Engine technology, which has been and is still being incorporated in new and derivative engines, is still in its infancy as far a commercial service, but it will still save 50 million gallons of fuel in 1987. The Advanced Turboprop technology is in the flight test phase and is planned for use on the new Boeing 7J7 and McDonnell Douglas MD-91 aircraft. Based on the projected market for these two aircraft, the potential cumulative fuel savings is estimated to be 5 billion gallons by the year 2010. Winglets and Wing Load Alleviation technologies developed in the Energy Efficient Transport program are being applied by the industry. The Wing Load Alleviation system used on the Lockheed L-1011-500 provides a 3 percent fuel savings. Winglets are planned for use on Boeing's 7J7 and 747-400 and McDonnell Douglas's MD-11. The Composite Primary Aircraft Structures technologies are being used by Boeing and McDonnell Douglas on their new generation of aircraft to provide significant weight savings over the use of metal for both primary and secondary structures. Laminar Flow Control technology, which has the potential of saving 20-40 percent in fuel, is currently planned for full-scale flight evaluation on a transport aircraft.

Many of the advanced technologies developed in NASA's ACEE program will be applied in a major way in the next generation transport aircraft. Figure 6 is a Boeing developed estimate showing the projected fuel efficiency for the 7J7 as compared to other existing transport aircraft. To a large extent, this improved efficiency is a result of the application of the technologies developed in the ACEE program. This is a clear example of a success story for NASA developed technology going into the next generation of transport aircraft that will benefit the Nation and the general public.

ENERGY EFFICIENT TRANSPORT

ADVANCED TECHNOLOGY FEATURES

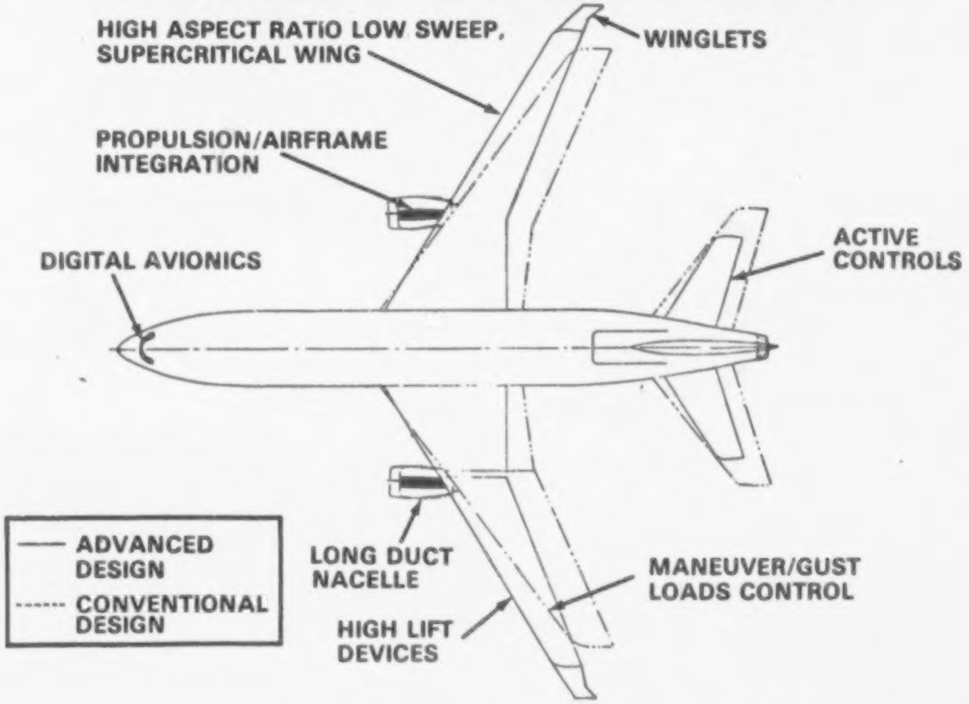

HIGH ASPECT RATIO LOW SWEEP, SUPERCRITICAL WING
WINGLETS
PROPULSION/AIRFRAME INTEGRATION
DIGITAL AVIONICS
ACTIVE CONTROLS
LONG DUCT NACELLE
MANEUVER/GUST LOADS CONTROL
HIGH LIFT DEVICES
ADVANCED DESIGN
CONVENTIONAL DESIGN

FIGURE 1

BOEING 747-400
747

Figure 2

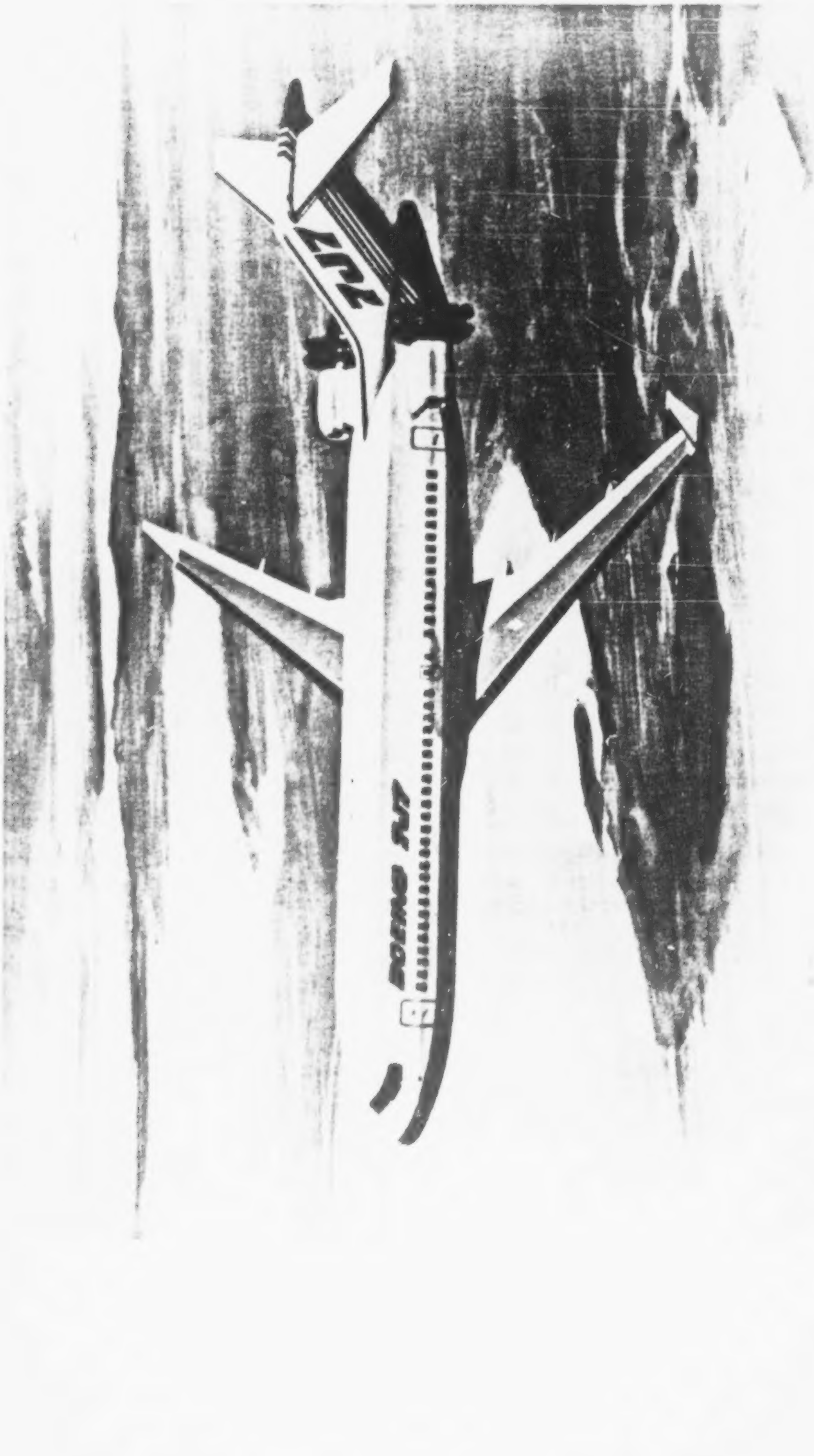

7J7
BOEING 7J7

Figure 3

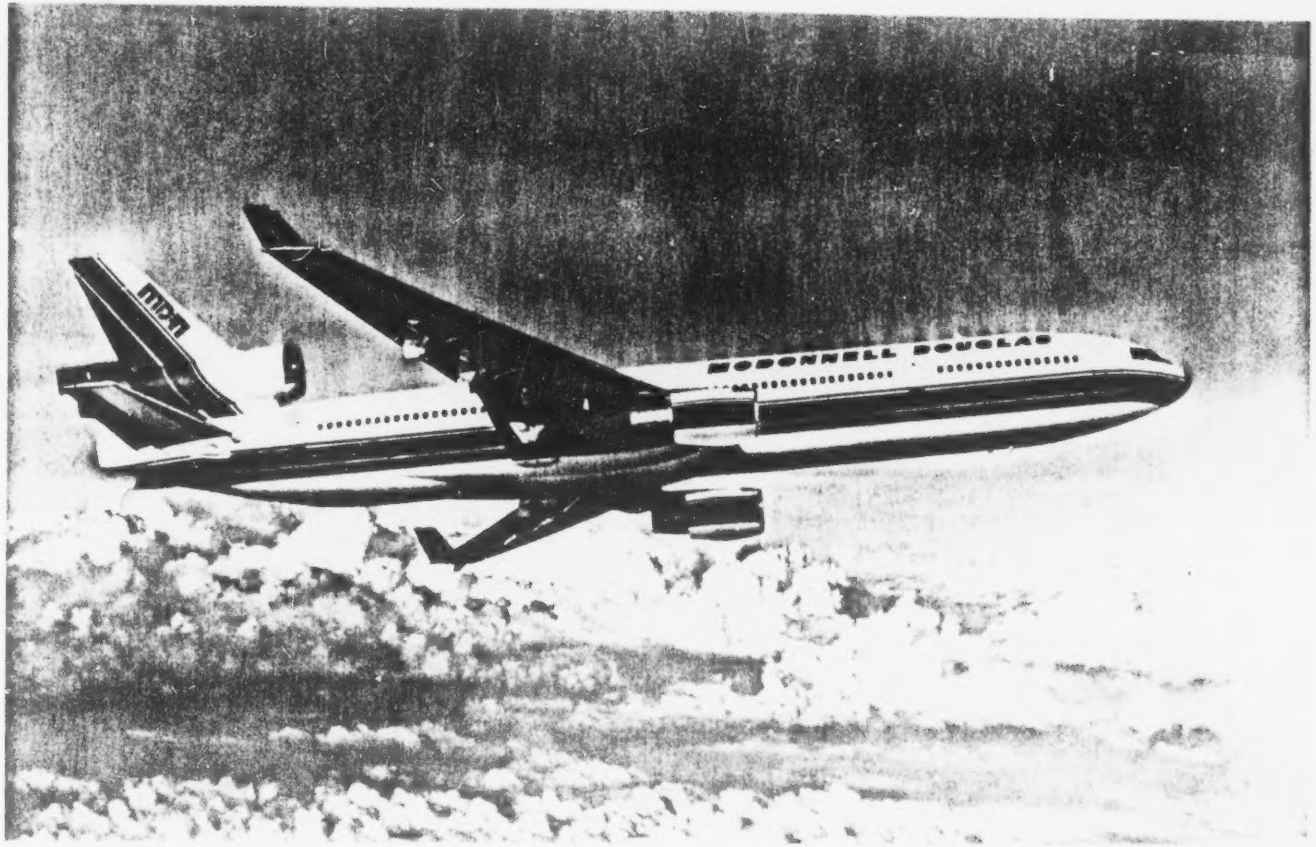

McDONNELL DOUGLAS
MDC

Figure 4

7J7 MATERIALS TECHNOLOGY

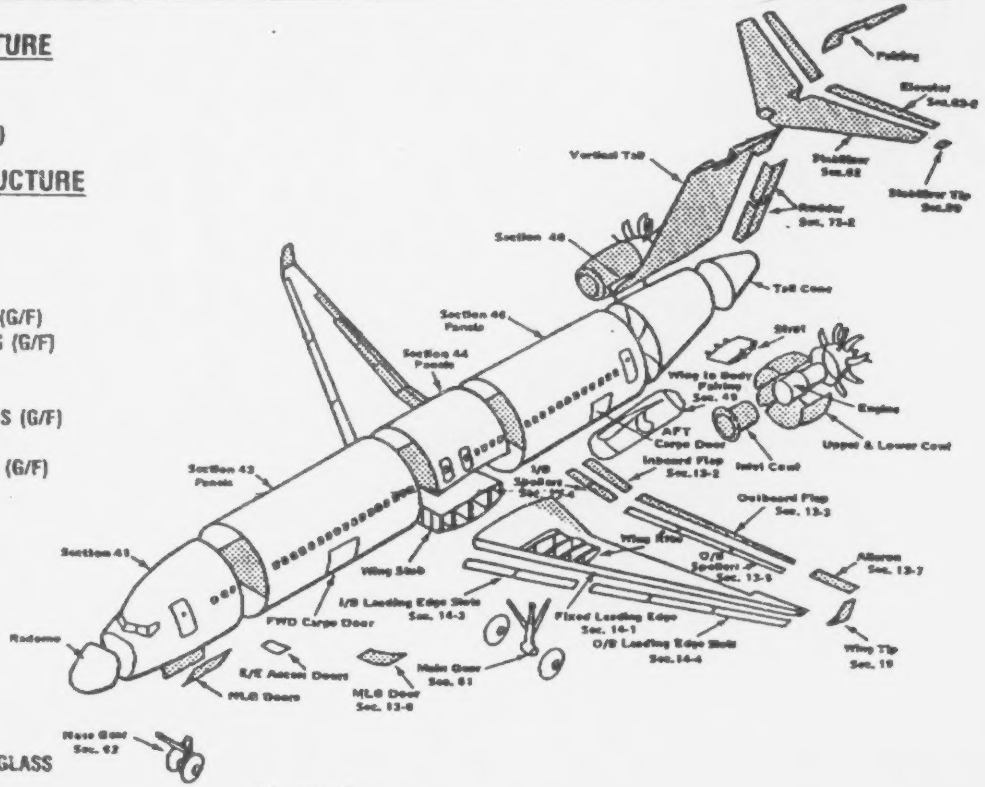
GRAPHITE COMPOSITES

PRIMARY STRUCTURE

VERTICAL FIN (G)
HORIZONTAL FIN (G)
BEAMS/STANCHIONS (G)

SECONDARY STRUCTURE

RUDDER (G)
ELEVATOR (G)
AILERON (G)
FLAPS (G)
FLAP TRACK FAIRINGS (G/F)
WING-TO-BODY FAIRING (G/F)
MLG DOORS (G)
ENGINE COWL (G)
ENGINE STRUT FAIRINGS (G/F)
FIXED T.E. WING (G/F)
FIXED T.E. EMPENNAGE (G/F)
NOSE GEAR DOOR (G)
WING TIP (G)


Fairing
Elevator Sec. 83-2
Stabilizer Sec. 82
Stabilizer Tip Sec. 89
Vertical Tail
Rudder Sec. 73-2
Section 48
Tail Cone
Section 46 Panels
Section 44 Panels
Strut
Wing to Body Fairing Sec. 49
Engine
Upper & Lower Cowl
AFT Cargo Door
Inlet Cowl
Inboard Flap Sec. 13-2
Section 43 Panels
I/B Spoilers Sec. 13-4
Outboard Flap Sec. 13-3
Wing Rear
O/B Spoilers Sec. 13-5
Aileron Sec. 13-7
Section 41
Wing Stub
I/B Leading Edge Slats Sec. 14-3
Fixed Leading Edge Sec. 14-1
O/B Leading Edge Slats Sec. 14-4
FWD Cargo Door
Radome
E/E Access Doors
MLG Doors
MLG Door Sec. 13-8
Main Gear Sec. 61
Wing Tip Sec. 19
Nose Gear Sec. 62

(G) GRAPHITE
(G/F) GRAPHITE/FIBERGLASS

Figure 5

TRANSPORT AIRCRAFT EFFICIENCY

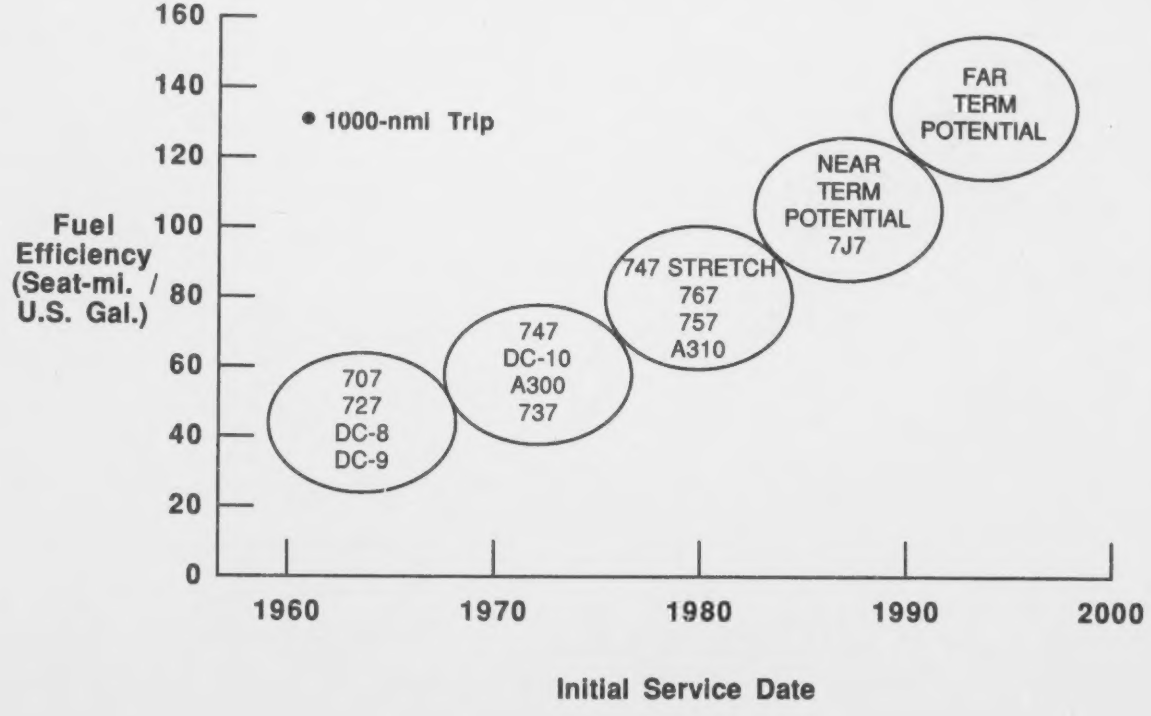


Figure 6

AIRCRAFT ENERGY EFFICIENCY PROGRAM

Senator GARN. Well, the point I'm making is we are basically being anecdotal, that's fine. But there are some very specific estimates that could be made that deal with not things out in space, but here on Earth that people use everyday where they receive a direct benefit, either in the form of a service or in saving of money.

And those are the sorts of things, even a few examples of those everyday things I think would help explain that we're getting a bargain for $7.5 to $9 billion a year of NASA expenditures compared to $140 billion for interest on national debt. I have yet to figure out what great benefit that is to society to spend that much for debt service.

Dr. COLLADAY. The investment that we made in the aircraft energy efficiency program is essentially complete. There's a clear audit trail on the technologies in high bypass ratio engines that are flying now in the CF-6 and JT-9D family and composites, more efficient wing designs, and the advance turbo prop that is now transitioned with the end of the innudated fan that GE and Boeing are working on. That's quite a success story.

Senator GARN. Well, you're talking about the very radically curved prop blades. You're talking about, what, another 30- to 35-percent efficiency over current jet engines?

Dr. COLLADAY. That's correct; over current high bypass ratio engines.

Senator GARN. Well, you see, this is a perfect example of what I'm talking about, because I served as chairman of this subcommittee for 6 years and I have questioned NASA in their hearings, and this is the first time I've heard that you had an audit trail on energy savings in your aircraft efficiency programs.

So, if the former chairman of the subcommittee doesn't know, certainly the American people do not know.

Dr. FLETCHER. I'm afraid that's a godsend, Mr. Chairman, and we have failed you in that regard. But we have the audit trail.

COST OF THE SPACE STATION

Senator GARN. Well, what I'm trying to do, because it's frustrating to fight the battles of the budget, and have so little knowledge and have such a poor job done by NASA of telling us and the American people what we're getting for those dollars we spend. Because all the stories have been about just the dollar cost on this space station and what are we going to do about it. You know the panic that has gone on in the administration and OMB on the release of that story. I bet you haven't even told OMB what they've got for their money over the years.

Dr. FLETCHER. I'm not sure they would pay much attention if you did.

Senator GARN. Well, there might be a few logical brains down there.

Dr. FLETCHER. You have hit on a crucial point though. We at NASA really are engineering oriented. We are engineering managers, and we don't market very well. Everybody says that the space program is very publicly oriented and so forth and so on. We're really not marketing people. We don't sell the program as well as we should. We're going to learn. We're going to do a better job.

Senator GARN. Well, I'm not suggesting you devote a lot of time to marketing. I'm suggesting you make the information available.

Dr. FLETCHER. We can do that.

Senator GARN. So it can be disbursed. You made an interesting point about you being engineers and scientists. I'm glad you are. But many people observe that that's one of the reasons why we find ourselves in the difficulty that we are in with the Japanese, for example, we've been innudated with calculators and watches and automobiles of Japanese technology. And some people have observed that the reason they have done so well is because we put our R&D and our development under the control of financing managers and accountants and they put their engineers and scientists in charge of their programs.

And I realize we can't let engineers and scientists run wild with no constraints at all. If we did, I can imagine what the R&D costs to this country would be.

So, there has got to be a better balance. And that's why I'm trying so hard today to say we've got to do a better job to show the financing managers that they get some real benefit for the dollars that are spent.

My time is well up, the chairman is here, and I turn it back to you, Mr. Chairman.

SPACE STATION BUDGET

Senator PROXMIRE [presiding]. Well, thank you. And I want to thank you very much, Senator Garn, for taking over the chairmanship. I don't know anybody who would do nearly as good a job as you undoubtedly did. I don't feel nearly as delinquent as I would otherwise.

We are delighted to have you back, Dr. Fletcher. Although your requested space station budget of $767 million for fiscal year 1988 is an increase of $347 million over the current budget, actually it's a small down payment on a very expensive system, even if you implement the program in two phases.

The total estimated cost of both phases for this space station under your latest implementation plan would be between $15.2 and $16.2 billion including $3 or $4 billion for phase II as compared with the $14.5 billion for an unphased program under your previous plan; is that correct?

Dr. FLETCHER. Well, the numbers are floating around a little bit, but those are in the right ballpark. They are the correct estimates for the fully operational space station, and it should be compared with our earlier estimate, $13 billion compared with $8 billion.

There is an item called DTMO, which stands for development test management and operation. This is the ground support activity that has to be added to the $13 billion. And if you add the DTMO for the fully operational station that would be $14.5 billion, which would be the best estimate for the fully operational space station at the present time.

Senator PROXMIRE. Well now this projection, either yours or mine, does not include the dollars we've already devoted to the station; isn't that correct? So if we added the $780 million appropriated to the space station between 1985 and 1987, the cost of the two-phase approach would increase to between $16 and $17 billion, and the cost of the first phase would be $13 billion, and I would have to adjust it somewhat to come down to your figure which is only $1 or $2 billion below that or would it be the same?

Dr. FLETCHER. Mr. Newman will comment on that.

Mr. NEWMAN. You are correct, Senator, except for $150 million in fiscal year 1987 that is there to initiate development. That amount is included in these estimates.

Senator PROXMIRE. $150 million is, but the rest is not?

Mr. NEWMAN. The rest of the prior appropriations is not.

Senator PROXMIRE. Thus far, we've been talking about station costs in terms of 1984 dollars, but we will be appropriating current year dollars. Since the recosting of your original plan in current dollars would push it up to $21.8 billion, including sunk costs, I assume your phased plan would cost up to $24.2 billion in current dollars with phase I costing around $19 billion; is that correct?

Dr. FLETCHER. No; that is not correct. That is a hypothetical cost, assuming something about inflation.

Senator PROXMIRE. Well, you have to assume something. Nobody expects us to have a stable or falling price level.

Dr. FLETCHER. That's right. But nobody that I know of is that good at predicting the precise inflation. So, what we do, Mr. Chairman, is try to predict in constant dollars and let someone else supply the inflation factor. You are as good at that as anyone. We certainly are not.

The $21 billion came from an arbitrarily imposed——

Senator PROXMIRE. Well, you're doing it in artificial dollars. You're doing it in 1984 dollars; that's 3 years ago.

Dr. FLETCHER. We can do it in 1988 dollars.

Senator PROXMIRE. The inflation last year wasn't much, but it was something. And the inflation in 1985 was substantial.

Dr. FLETCHER. You're quite right, Mr. Chairman. We can estimate the past rather accurately in terms of inflation. I think the numbers come out approximately 17 percent larger.

Mr. MYERS. In 1988 dollars the percentage increase was 19 percent.

Dr. FLETCHER. A 19-percent increase.

Mr. MYERS. 1984 to 1988.

Senator PROXMIRE. OK. OMB Director Miller's February 10 memorandum to the President indicates that station cost projections do not include the cost of operating the facility once it is completed, and that's estimated to be at least $1 billion per year in 1984 dollars. In current year dollars we would be talking about $1.4 billion a year in operating costs at a minimum, I would think. Do you think that is an excessive estimate?

Dr. FLETCHER. The operating costs are first cuts. We are just beginning to do the operational costs as we did the development costs 2 or 3 years ago. We have a very strong group developing those estimates. The first cut of those estimates, I believe, is on the order of $1 billion a year for operating costs when the space station is fully operational.

Senator PROXMIRE. Again, that's 1984 dollars; correct?

Dr. FLETCHER. That's 1984 dollars again, Mr. Chairman.

Mr. MYERS. Part of which would be paid by the international partners in the space station.

Senator PROXMIRE. That would be $1.2 in 1987 dollars?

Mr. MYERS. Approximately, yes. But those are very preliminary numbers. We have defined the space station. We have not yet defined the details of the operational plans; and that's what this task force is now working on.

COST OF TRANSPORTATION FOR ASSEMBLY

Senator PROXMIRE. Now, apparently the new estimate also leaves out the cost of transportation to assemble the station and to carry cargo and passengers to and from the station. Let's take those one at a time. What are your projections of the cost of transportation for assembly of the station through the end of phase I in current year dollars, not 1984, but current?

Mr. NEWMAN. If you price 11 flights in today's dollars——

Senator PROXMIRE. If what?

Mr. NEWMAN. Pricing 11 flights to assemble in today's dollars, it would be about a little over $1 billion.

Mr. MYERS. Eleven flights are required to get us to the permanently manned capability in the space station. And with 11 flights at today's current rates, we estimate approximately $1 billion for transportation.

ASSEMBLY COST OF PHASE II

Senator PROXMIRE. Now, what do you estimate will be the transportation costs of assembling phase II of the station, again in current year dollars?

Mr. MYERS. The total number of flights involved with the shuttle through the completion of phase II also includes a series of logistic flights; that is, flights to transfer people up and back and equipment up and back. The total of that would be 32 flights, 11 of which were used for the permanent manned capability, leaving 21 flights. It would cost about $2 billion additional over a period of several years more.

Mr. NEWMAN. Including the support of operations during that period.

Dr. FLETCHER. Mr. Proxmire, I propose that we supply that information for the record, because we're combining operations costs with the assembly costs, and they need to be identified separately for the record.

[The information follows:]

Assembly Cost of Phase II

- Space Station Development (Dollars in Millions)

	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
RY $	603	1498	1575	2271	2459	2691	2450	1401	785
88 $	603	1426	1426	1957	2016	2098	1818	989	527

- Laboratory and Technical Services (Dollars in Millions)

	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
RY $	130	257	270	306	253	264	187	86	62
88 $	130	245	244	263	207	206	139	61	42

- Flight Telerobotic Servicer (Dollars in Millions)

	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
RY $	22	45	45	35	35	35	35	35	35
88 $	22	43	41	30	29	27	26	25	20

- Operations and Operations Studies (Dollars in Millions)

	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
RY $	7	19	80	200	400	700	925	1100	1252
88 $	7	18	72	172	328	546	686	777	835

- Transition Definition (Dollars in Millions)

	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
RY $	5	25	25	40	40	40	40	40	40
88 $	5	24	23	34	33	31	30	28	23

- Facilities -- Major Projects (Dollars in Millions)

	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
RY $	26	105	55	23	18	--	--	--	--
88 $	26	100	50	20	15	--	--	--	--

- Marginal Transportation Costs

If a marginal cost basis of $36.5 million (1984 $) per Shuttle flight were used for the listed flight rates to support the revised baseline, the cost would be:

	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
RY $	2	21	86	221	352	346
88 $	2	17	69	170	259	244

- All other Space Station related development costs

Preliminary studies are underway on a berthing device for the Shuttle to link up with the Space Station. The ROM estimate for this is $70 million. Phasing requirements are not established at this early stage. Although we have identified a set of potential payloads for the Space Station, the selection of specific payloads has not had to have been made due to their significiantly shorter development periods. The costs of new candidate payload developments and modifications to existing payloads was provided in appendices to the April 1987 document, "A Space Station Program Plan for Selected Design Parameters."

RECONCILIATION OF SPACE STATION ESTIMATES
FY 84 $B
Current Phased Program

	OSS APRIL TESTIMONY IN FY 84 $	OSS JULY TESTIMONY IN FY 84 $	NRC REPORT IN FY 84$	GAO FACT SHEET-7/8 IN FY 84 $
Block I				
Flight Hardware Development	10.9	10.9	12.2	10.9
Basic Lab and Tech Support	1.3	1.3	(Incl above)	1.3
Flight Telerobotic System	250 m	250 m	0.3	212 m
Transition Definition	197 m	197 m	0.2	150 m
Operations (through FY 96)	2.9	2.9	3.0	2.9
CERV	1.5	1.5	1.5	0.7-1.5
Block II				
Flight Hardware Development	3.4	3.4	3.8	3.4
Basic Lab and Test Support	0.4	0.4	(incl above)	0.4
Additional Operations (thru '98)	1.6	1.6	1.4	1.6
OMV--2nd Unit Recurring Cost	--	--	0.1	0.1
Total OSS R&D Costs	22.5	22.5	22.5	22.5
Constr of Facilities	200 m	200 m	0.2	200 m
STS Costs (# STS Flights)	(#16) 1.0	(#16) 1.3	(#31) 2.5	(#31) 2.4
(STS Cost per Flight)	(63 m)	(78 m)	(78 m)	(78 m)
R&PM Costs (1988-1998)	2.5	2.5	2.5	??
TDRSS and Related	No estimate available	No estimate available	No estimate available	No estimate available
Total (excluding TDRSS)	26.2	26.5	27.7	N/A

NO ESTIMATES FOR TDRSS RELATED EFFORTS ARE INCLUDED IN ABOVE ESTIMATES

RECONCILIATION OF SPACE STATION ESTIMATES
FY 88 $B
Current Phased Program

	OSS APRIL TESTIMONY IN FY 88 $	OSS JULY TESTIMONY IN FY 88 $	NRC REPORT IN FY 88$	GAO FACT SHEET-7/8 IN FY 88 $
Block I				
Flight Hardware Development	13.0	13.0	14.6	13.0
Basic Lab and Tech Support	1.6	1.6	(Incl above)	1.6
Flight Telerobotic System	288 m	292 m	0.3	0.3
Transition Definition	230 m	230 m	0.2	0.2
Operations (through FY 96)	3.4	3.4	3.6	3.4
CERV	1.8	1.8	1.8	1.0-1.8
Block II				
Flight Hardware Development	4.0	4.0	4.5	4.0
Basic Lab and Test Support	0.5	0.5	(incl above)	0.5
Additional Operations (thru '98)	1.9	1.9	1.7	1.9
OMV--2nd Unit Recurring Cost	--	--	0.1	0.1
Total OSS R&D Costs	26.7	26.7	26.8	26.8
Constr of Facilities	239 m	239 m	0.2	239 m
STS Costs (# STS Flights)	(#16) 1.2	(#16) 1.5	(#31) 3.0	(#31) 2.9
(STS Cost per Flight)	(75 m)	(95 m)	(95 m)	(95 m)
R&PM Costs (1988-1998)	2.9	2.9	2.9	??
TDRSS and Related	No estimate available	No estimate available	No estimate available	No estimate available
	——	——	——	——
Total (excluding TDRSS)	31.0	31.3	32.9	N/A

NO ESTIMATES FOR TDRSS RELATED EFFORTS ARE INCLUDED IN ABOVE ESTIMATES

OFFICE OF SPACE SCIENCE AND APPLICATIONS

SPACE STATION INTEGRATION OFFICE

ALLOCATION PLAN FOR FY 1987 FUNDING AUGMENTATION
FOR
SPACE STATION EXPERIMENT DEFINITION

JULY 28, 1987

Enclosure A

INTRODUCTION

The Senate and the House of Representatives Appropriations Committees have directed NASA to allocate in FY 1987 an additional $7.5M for Space Station experiment definition. The Committees specified that the funds be used primarily for attached payloads and that they be allocated through a peer review system spread throughout all disciplines. A separate congressional allocation of $7.5M was made for microgravity science and applications, and that discipline is treated in a separate plan which has been submitted.

The Appropriations Committees requested that NASA submit a plan for the use of these funds in accordance with the above directions. This document outlines the requested plan. It reflects the judgment and advice received by the Office of Space Science and Applications (OSSA) from the Space and Earth Sciences Advisory Committee (SESAC) and from the special SESAC task force, the Task Force for the Scientific Uses of the Space Station (TFSUSS). Enclosed with this plan is an attachment to a letter from Louis J. Lanzerotti, Chairman of the SESAC, to Daniel J. Fink, Chairman of the NASA Advisory Council, dated March 4, 1987, providing recommendations for NASA planning for the Space Station. This enclosure, together with the SESAC report, "The Crisis in Space and Earth Science," a summer study report from the TFSUSS, and discussions and recommendations from interested scientists and OSSA staff members was drawn upon to formulate this plan.

The funds allocated in FY 1987 and requested in FY 1988 will be devoted to improving OSSA's ability to use the Space Station early in its operational phase for important scientific and applications investigations. None of the funds will be used for the development of flight hardware. The selection of payloads for flight assignment is expected to begin in FY 1988. A Space Station Science Management Operations Working Group has been convened to examine current NASA management practices and to recommend the operational environment for OSSA use of the Space Station. NASA procedures for the selection and assignment of investigations to the Space Station is a major subject of the Working Group's deliberations. The Working Group is scheduled to release its recommendations in September/October 1987. Assuming the procedures can be implemented in FY 1988, we will make the first round of selections in FY 1988/1989 and begin funding of flight hardware in FY 1990. A second round of selections will be started in FY 1989 directed toward initial hardware funding in FY

1991. Subsequent selections will be made as appropriate in concert with the Space Station schedule and the opportunity for accommodating investigations.

FUNDING PLAN

The $7.5M made available in FY 1987 for experiment definition of Space Station payloads will be divided among three activities: identification of new experiment concepts that make particularly good use of the Space Station; definition and accommodation requirements of high priority payloads that show particular promise for flight on the Space Station; and study of Space Station technologies that will increase the efficiency and economy with which OSSA can use the Space Station. The $7.5M will be distributed approximately: $3.4M -- identification of new experiment ideas; $2.9M -- development of high priority payloads; and $1.2M -- study of Space Station technologies. The final distribution of the funds will be a function of the specific requirements in the individual categories.

The supplemental funds to support the experiment definition effort described in the following paragraphs will be distributed through the OSSA Space Station Integration Office. The definition studies supported by these funds will be monitored by personnel from the OSSA Space Station Integration Office with the appropriate discipline office personnel as the co-monitors. In this manner, the Space Station interests will remain paramount, but with oversight by the discipline chiefs to assure that the research continues to be of high scientific merit and of high potential for flight on the Space Station.

Formal reviews will be held at the end of the one year funding period. A continuation of the funding through FY 1988 is planned for projects that are making good progress towards being ready to compete in the first announcement for flight assignment. New candidates will be sought and definition funding for them initiated in FY 1988. Funds to provide continued support have been requested in the Space Station Integration Office FY 1988 budget. Table I summarizes the distribution of funds in FY 1987 and the plan for funding Space Station related experiment definition studies in FY 1988. Atttached payloads that were not funded are listed in Table II.

Prime responsibility for the continued definition of investigations for the Space Station will shift to the discipline divisions in FY 1989. This will assure that the developments carried out under this program retain their scientific merit and remain integral parts of the disicipline division science and applications programs. The FY 1989 funds requested by the OSSA Space Station Integration Office will be used primarily for generic Space Station accommodation studies.

Dr. Louis Lanzerotti, Chairman of the OSSA Space and Earth Sciences Advisory Committee, will be asked to convene a committee representing the space and earth sciences, life sciences, and space applications communities. It is anticipated that the group would peer review these plans and provide advice on the implementation of the congressional request.

IDENTIFICATION OF NEW EXPERIMENT OPPORTUNITIES

The identification of new experiment opportunities is an attempt to draw from the community of potential Space Station users the newest ideas for Space Station experiments. Preference will be given to those ideas that can be competitive for a flight opportunity early in the Space Station operational era. In their "Crisis" report, SESAC emphasized that initial Space Station investigations should be simple and that NASA avoid the temptation to select overly complex investigations before the full capability of the Space Station is known and tested. This philosophy is reflected in the OSSA funding actions, i.e., preference is given to pathfinder investigations that 1) do not place great demahds on Space Station resources, 2) are simple to integrate and operate, and 3) are relatively inexpensive.

Astromag ($0.70M)

The Space Station is ideally suited to support instrumentation to investigate very high energy and very heavy cosmic radiation. The astrophysics community has identified a superconducting magnetic charged particle spectrometer as a leading candidate for an early flight on the Space Station. This instrument, called Astromag, can address several questions regarding the existence of anti-matter and dark matter in the universe and the evolution of high energy elementary particles in the galaxy by directly sampling galactic material that reaches into the solar system. Several major technological questions exist which must be addressed before the Astromag can be given an assignment to the Space Station. The configuration of the magnetic coil must be investigated; the type of magnet, charging and discharging of the magnetic coil, alternatives for cooling the magnet, and the availability and usefulness of the new high temperature superconducting materials must be investigated.

Pinhole Occulter Facility ($0.3M)

The Pinhole Occulter Facility (P/OF) is a large, but simple, instrument to study the solar corona. The pinhole disk is mounted on a 50 meter long boom and serves as an artificial moon to occult portions of the sun. The long boom is required for high precision occultation and for high precision imaging of x-rays from solar events, e.g., flares. The funds allocated here will be used to study accommodation on the Space Station, structural stability of the boom, and to investigate pointing and instrument accommodation requirements of the P/OF.

Cosmic Dust Collector ($0.63M)

The determination of the origin and evolution of the solar system is a major goal of the solar system exploration community. Generally, studies of the solar system have been carried out through two mechanisms: 1) by planetary probes carried to the planets and asteroids; and, 2) by ground-based telescopes observing through the earth's atmosphere. The Space Station offers two opportunities to conduct forefront investigations of the solar system. The first is a planetary astronomy telescope mounted on the Space Station above the obscuring atmosphere. The second is to collect cosmic dust particles from the environment of the Space Station. This latter investigation lends itself particularly well to early flight on the Space Station. A cosmic dust collector on the Space Station opens an entirely new phase of solar system study. An appropriately designed Space Station dust collector will make it possible to determine the orbits of individual dust particles. From this instrument, scientists will be able to separate cometary material, interplanetary dust, and interstellar particles, which otherwise is not possible from a smaller instrument on an interplanetary trajectory or a smaller sample return mission. The acceptable geometry of the detector for both scientific and operational purposes, must be studied prior to deploying it on an early Space Station mission. This is due to the size of the cosmic dust collector. Possible obscuring of other Space Station instruments must be investigated; and the mounting, deployment and recovery, and return to earth of collected samples must all be studied.

Astrometric Telescope Facility ($1.0M)

The identification of planetary systems around other stars at different stages of astronomical development would provide major new scientific information on the evolution of our own solar system. Results from the Infrared Astronomy Satellite, which observed nearby stars with possible planetary systems around them, has increased the interest in the scientific community to search nearby stars for other solar systems. An astrometric telescope mounted on the Space Station can perform this task. It can also observe parts of the sky not available to other telescopes which are restricted by the angle between the sun and the spacecraft's solar panels or to a terrestrial telescope restricted by weather or other limited seeing conditions. The ready accessibility of the Space Station makes it possible to change out detectors as new instruments become available. As a dedicated planetary telescope, it can be used for synoptic observations of the outer planets that are not possible on astronomical telescopes of equal optical quality. Many technical problems related to the High Resolution Solar Observatory (HRSO) also apply to the astrometric telescope. These problems must be investigated as they relate specifically to a planetary telescope. In addition, the funds allocated under this task will be used to understand restrictions in pointing direction and slewing angles as well as the operational mechanics of instrument servicing and detector replacement.

Plasma Interaction Monitoring System ($0.25M)

Several scientific, as well as operational, aspects of the Space Station require a clean, well understood environment around the Space Station. The cosmic dust detector will help measure the particulate environment around the Space Station, but knowledge of the charged particle plasma environment is also required. The plasma interaction monitoring system (PIMS) will provide these data. In FY 1987 and 1988, theoretical studies will be undertaken to better understand the specific nature of the interaction of the ambient space plasma with the currently configured Space Station. Following the theoretical studies, the investigartors will begin to model the interaction in a laboratory. The output of these studies will be the definition of a series of diagnostic plasma instruments to measure the environment and the configuration of the flight instruments that is required to assess the complete plasma environment of the Space Station.

Tropical Regions Imaging Spectrometer ($0.50M)

The tropical regions contain the most intense levels of biological and energetic activity on Earth. The rain forests and tropical oceans contain much of the global biological productivity. Evaporation of the tropical oceans provides most of the atmospheric moisture. Atmospheric convection is driven to extremes by both the direct input of solar heat and the latent heat derived from oceanic evaporation. This results in an overall rising circulation to the low latitude atmosphere which determines much of the overall atmospheric circulation. The Tropical Region Imaging Spectrometer (TRIS) can provide critical visible and infrared observations of the tropics with frequent coverage and 300 to 1000 meter resolution. The low inclination of the Space Station orbit will provide unique opportunities to observe the land, oceans, and atmosphere of the tropics at all local times. The spectral coverage should be virtually continuous and will have a resolution of 10 nm in the visible and 500 nm in the thermal infrared.

TRIS is planned to use a scanning technique which will give moderate spatial resolution but will require only modest pointing and stability. These can easily be accommodated in the early Space Station configuration, making TRIS an ideal candidate for an early flight assignment. The funds made available here will be used to study the design of the instrument, the sampling modes of TRIS, and the details of the accommodation of TRIS on the Space Station.

DEVELOPMENT OF HIGH PRIORITY PAYLOADS

OSSA plans to direct approximately $2.9 M of the FY 1987 supplemental funding to support the definition and laboratory development of currently identified high priority payloads that show promise as candidates for early flight on the Space Station. Funds will be used for definition work only.

Solar Terrestrial Observatory Experiment Definition ($0.5M)

The Solar Terrestrial Observatory will consist of groupings of instruments that have already been developed and flown on Spacelab, ATLAS-1, and the Space Plasma Laboratory. These instruments are scientifically of high priority, they exist, and they are, as such, ideal candidates for early Space Station flight. The funds allocated here will be used to: 1) define the necessary packaging modifications to launch and accommodate them on the Space Station; 2) operate them either on board the Station by the crew or from the ground; and, 3) service and maintain them on the Space Station. New instruments with possible foreign participation may be selected in the future.

Tropical Rain Measurement Mission ($1.0M)

The Tropical Rain Measurement Mission (TRMM) is a Space Station attached payload designed to observe tropical rainfall for scientific study. The long range plan for TRMM is to evolve it into a small, low cost satellite. The combined Space Station and satellite program will provide data to overcome the deficiencies in sampling and spatial resolution that have precluded accurate estimates of precipitation in the tropics. The instrument complement will consist of a group of active and passive microwave sensors and visible and infrared detectors. The funds allocated here will be used to size the hardware; better understand power, weight, and cost requirements; better define the science requirements; conduct a design study for an airborne TRMM simulator; develop ground truth and rain gauge deployment strategies; and continue modeling studies of the radiative transfer within the precipitating clouds.

Earth Radiation Budget Instrument ($0.30M)
(Hitchhiker 4)

Climatological modeling studies predict that the Earth's climate will undergo major changes in the next ten to twenty years from radiative forcing of trace gases, e.g., carbon dioxide, methane, and fluoronated carbons. These changes could have a profound effect on circulation, precipitation patterns, and cloud cover distribution. The full impact of these gases is not yet understood, and, therefore, the continuous monitoring of the radiation budget is a key component in bettering our understanding. The absence of earth radiation budget measuring satellites and the shortcomings in spectral measurements from operational satellites in the 1990's has created a gap in high resolution and broad band spectral coverage of the atmosphere. NASA plans to minimize this absence of good data by flying a radiation budget instrument as an attached payload on the Space Station. The funds allocated to this effort in FY 1987 will be used to study instrument requirements for a broad band earth radiation budget spectral instrument for the Space Station and to study absolute calibration and sampling rate requirements for the instrument in the Space Station environment.

Laser Atmospheric Wind Sounder ($0.60M)

The objective of the Laser Atmospheric Wind Sounder (LAWS) is to better understand horizontal and vertical atmospheric motion, particularly in the tropics. LAWS is planned for flight on the Space Station as an attached payload. The specific requirements for LAWS are to determine atmospheric wind profiles to a vertical accuracy of 1 km, a horizontal resolution of approximately 100 km, and a time resolution of 1 meter per second. Atmospheric motions in the tropical and subtropical latitudes are caused by subtle pressure differences in the atmosphere. Because of the importance of these motions on energy and water cycles, special emphasis is placed on precision measurements at these latitudes. The low inclination of the Space Station makes it an ideal carrier for LAWS. The experiment definition funds will be used to assess current laser technology, total system requirements, integration and packaging concepts, and development and laboratory test of a brassboard laser to demonstrate overall optical alignment maintainability of a space based laser.

Large Area Modular Array of Reflectors($0.50M)

The Large Area Modular Array of Reflectors (LAMAR) represents a high-sensitivity, moderate resolution imaging x-ray telescope for the study of faint cosmic x-ray sources. LAMAR will be used to investigate pre-main sequence stars, x-ray emitting dark matter in the unverse, and galaxy clusters which are weak x-ray emitters but scientifically very important.

Each LAMAR module consists of 8 grazing incidence x-ray mirrors and imaging proportional counters. It has an angular resolution of about 30 arcseconds, in the energy range of 0.1 to 10 kilo electron volts, and a sensitivity about 5 times that of HEAO-2. Due to its modest pointing and stability requirements, LAMAR is ideally suited to flight early in the Space Station program. The funds made available here will be used to conduct system studies for the accommodation of LAMAR on the Space Station, to better understand attachment requirements and the potential for adding additional modules in future increments, and to gain a better understanding of possible Space Station disturbing forces on the instrument.

SPACE STATION TECHNOLOGY STUDIES

Phase I/Phase II Impact Studies ($0.72M)

The structuring of the Space Station Program into Phase 1 and Phase 2 has brought about changes in the OSSA plans for early use of the Space Station for attached payloads. The final segment of the $7.5M will be used to examine in detail: 1) the facilities and utilities available under Phase 1; 2) the impact of Phase 1 changes on the current OSSA plans for the early use of the Space Station; and, 3) the schedule for bringing on line the remaining facilities in Phase 2.

Space Station Operations Support Studies ($0.5M)

The Space Station will incorporate technical facilities and operational procedures that have not been available previously in the space program and frequently are not well understood by potential users. The successful use of the Space Station for scientific and applications investigations is a function of the ease with which a user can interact with the Space Station facilities. The remaining funds allocated to Space Technology studies will be used to investigate and understand several technical aspects which can ease or encumber a user's interface with the Space Station and which, if adequately understood, can lower the cost of conducting science and applications investigations on the Space Station.

For investigators operating payloads in the attached mode, it is important to understand the use of the booms in mounting and servicing attached payloads. Several science and applications disciplines have also shown a particular interest in the installation of small get-away-special class payloads. The logistics of bringing small payloads to the Space Station, the pre-launch ground operations, and the operations of several non-interfering payloads operating from one attachment point must be studied. An understanding of the commonality of components between the attached mode of operation and a platform is important to lower the cost of transitioning an attached instrument to flight on a platform.

In planning an investigation, it is impractical to plan to transport individual scientists to the Space Station to make an observation. Several scientific disciplines have developed fully automated instrumentation to operate in space. Others require major human involvement to conduct an experiment. This led to the recognition that the capabilities of modern telecommunications must be employed to overcome this situation. This is the concept of telescience. The techniques of telescience coupled with developments in automation and robotics will contribute greatly to the creation of a friendly environment for the Space Station user. The entire concept of operations from a distance, automation, data recovery and processing, and rapid and unencumbered two-way communications between the user and his/her instrument on the Space Station is incorporated into the Science and Applications Information System (SAIS). The ongoing SAIS studies will be augmented with FY 1987 funding in order to gain a fuller appreciation of the implementation problems and costs required to bring the SAIS to operational readiness.

The OSSA discipline divisions and the NASA Field Centers have identified additional worthwhile attached payload accommodation studies, for which funds were not available in FY 1987 but which will be considered for future funding. These are listed in Table III.

TABLE I

OFFICE OF SPACE SCIENCE AND APPLICATION

SPACE STATION INTEGRATION OFFICE

FY 1987 AND FY 1988 EXPERIMENT DEFINITION PROGRAM

TASK	DIVISION	FY 1987	FY 1988	PAYLOAD
ASTROMAG	ASTROPH	$0.70 M	$0.85 M	ATTACHED
PINHOLE OCCULTER FACILITY	ASTROPH	.30	.40	ATTACHED
COSMIC DUST COLLECTOR	SOLAR SYS EXP	.63	.75	ATTACHED
ASTROMETRIC TELESCOPE FACILITY	SOLAR SYS EXP	1.00	1.25	ATTACHED
PLASMA INTERACTION MONITOR SYSTEM	EARTH SCI & APPL	.25	.40	ATTACHED
TROPICAL REGIONS IMAGING SPECT.	EARTH SCI & APPL	.50	.50	ATTACHED
SOLAR TERRESTRIAL OBSERVATORY EXP DEFINITION	EARTH SCI & APPL	.50	.60	ATTACHED
TROPICAL RAIN MEASUREMENT MISSION	EARTH SCI & APPL	1.00	1.00	ATTACHED
EARTH RADIATION BUDGET INST	EARTH SCI & APPL	.30	.30	ATTACHED
LASER ATMOSPHERIC WIND SOUNDER	EARTH SCI & APPL	.60	.60	ATTACHED
LARGE AREA MODULAR ARRAY OF REFLECTORS	ASTROPH	.50	.50	ATTACHED
PHASE I/PHASE II IMPACT STUDIES	SPACE STA INTEG	.72	--	ALL CLASSES OF PAYLOADS
OPERATIONS SUPPORT STUDIES	SPACE STA	.50	.65	ALL CLASSES OF PAYLOADS
TOTAL		$7.50 M	$7.80 M	

TABLE II

NON-FUNDED SPACE STATION ATTACHED PAYLOAD CANDIDATES

Laser Communications Engineering Test
High Resolution Astronomical Telescope and Spectrometer
Solar Optical Universal Polarimeter
Cosmic Ray Nuclei Experiment
Heavy Nuclei Collector
Solar X-Ray Telescope
Diffuse X-Ray Spectrometer
Broad Band X-Ray Telescope
Search and Rescue Interferometer
Large Area Modular Array Reflector
Space Based Antenna Test Range
Synthetic Aperture Radar for Search and Rescue
Submillimeter Astronomy Telescope
Space Station Accommodation of the ASTRO Instruments

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TABLE III

NON-FUNDED SPACE STATION ATTACHED PAYLOAD SUPPORT STUDIES

Attached Payload Instrument Control Center
Attached Payload Pointing System Studies
Attached Payload Accommodation Studies

Enclosure B

SESAC Statement on Planning for the Space Station

The Space and Earth Science Advisory Committee's (SESAC) Task Force on the Scientific Uses of the Space Station (TFSUSS) has continued to keep the Committee informed of TFSUSS's advisory activities associated with the planning of the Station. SESAC's recent report, "The Crisis in Space and Earth Science," also considered some of the implications of the forthcoming construction of the Space Station. While recognizing that "Space Station offers the prospect of a major new capability for carrying out space research," the report also identified ways that Space Station may impact the present and planned Space and Earth Science program. Further, the report made suggestions about the manner in which the Space Station and the associated experimental program should be developed for optimum benefits to science. SESAC reaffirms its earlier conclusions regarding the additional steps that must be taken to assure that Space Station will carry out the most effective scientific program. The Committee also believes that strong continuing scientific oversight of the Space Station is required to ensure that the program will actually meet its scientific potential.

- In particular, SESAC recommends that in the near future the NASA Advisory Council should form a standing committee with strong scientific representation to oversee future Space Station development and operation. Such a committee can help assure, as TFSUSS and the Office of Space Science and Applications (OSSA) management have done thus far, that the scientific community is kept abreast of the development of this important research facility and that the engineers are aware of and take into account evolving scientific needs in the implementation of the Space Station program. This committee should allow regular and easy interaction between scientific users of the Station and its designers. In recognition of the fact that a Space Station science program is only a part of the larger ensemble of scientific and technology activities supported by Office of Space Science and Applications and NASA, provision must be made to provide a strong linkage between this Committee and the other appropriate committees of the NAC.
- In order to ensure that the Space Station fulfills its scientific potential, care must be exercised throughout the phases of Station design, development, activation, and use. The Station's design must be flexible enough to allow modification as experience with the Station is gained. As the Shuttle/Spacelab experience has amply demonstrated, it is critical to start with simple experiments and then build up toward more complex ones once the Station's capabilities (as well as limitations) become apparent. In the same vein, it is important not to select instruments which fully utilize the technical capabilities of the Station without some experience on board the Station itself. Once this experience is available, instruments that fully utilize the Station's unique capabilities can be more easily and properly designed.

- Additional research support will be required to met the new opportunities afforded by the Space Station. By virtue of its unlimited flight time, its less restrictive internal space requirements, and the continued presence of humans, Space Station will permit substantial new opportunities for research in life and microgravity science. NASA's scientific budget must grow if the scientific needs of these emerging disciplines are to be properly fulfilled.

- SESAC reiterates the conclusion contained in its "Crisis" report that the Space and Earth Science program can be best kept vital by providing a broad range of flight opportunities, of which Space Station will be only a single component. NASA must continue to recognize that, from a scientific perspective, the Space Station is not an end in itself, but only one of a set of tools to be used for addressing a broad array of scientific problems.

Enclosure C

OFFICE OF SPACE SCIENCE AND APPLICATIONS

CANDIDATE SPACE STATION ATTACHED PAYLOADS

PRELIMINARY PHASED FUNDING ESTIMATES - PHASE C/D

COSTING ASSUMPTIONS

- PHASE C/D ONLY
- INSTRUMENT COST ONLY
- CONSTANT YEAR (FY 1987) DOLLARS

PRELIMINARY PHASED FUNDING ESTIMATES - PHASE C/D
(FY 1987 Constant Year Dollars in Millions)

	L-5	L-4	L-3	L-2	L-1	L-0	TOTAL
COSMIC DUST COLLECTOR		5.5	6.5	6.5	4.5	2.5	25.5
PLASMA INTERACTION MONITOR SYSTEM		8.0	11.0	8.5	8.0	2.0	37.5
EARTH RADIATION BUDGET EXPERIMENT		2.5	2.5	3.5	3.5	2.0	14.0
SOLAR TERRESTRIAL OBSERVATORY: SOLAR INSTRUMENT GROUP		4.0	7.5	10.0	9.0	9.0	39.5
SOLAR TERRESTRIAL OBSERVATORY: PLASMA INSTRUMENT GROUP		6.0	10.0	12.0	11.5	10.0	49.5
TROPICAL RAIN MEASUREMENT MSN.		15.5	25.5	26.0	13.0	6.0	86.0
ASTROMETRIC TELESCOPE FACILITY	12.0	31.0	46.0	35.0	17.0	8.5	149.5
LASER ATMOSPHERIC WIND SOUNDER	5.0	16.0	31.0	29.5	21.0	10.0	112.5
ASTROMAG		18.0	20.0	13.0	6.0	3.0	60.0
PINHOLE OCCULTER FACILITY		2.0	19.0	36.0	25.0	13.0	95.0
LARGE AREA MODULAR ARRAY OF REFLECTORS				8.0	7.0	5.0	20.0
TROPICAL REGIONS IMAGING SPECTROMETER		16.0	22.0	20.0	13.0	3.0	74.0

Senator **Proxmire**. Oh, yes, I think we ought to separate them out, but I think we ought to know what the total whole operation is. I understand you would be making eight trips or so a year to the station once it's in operation, that is, what would that cost each year again in current dollars?

Mr. **Newman**. We are now reviewing the possibility and probability of reducing the number of operational flights to five or six flights per year in support of the space station.

Senator **Proxmire**. How much would that cost?

Mr. **Newman**. That would be $500 to $600 million.

COST OF SCIENCE AND TECHNOLOGY EXPERIMENTS

Senator **Proxmire**. $500 to $600 million; I'll buy it.

Do you have any projections on how much you will spend on science and technology experiments each year once the first phase of the station is operational? If you do, I'd like that estimate in 1987 dollars.

Dr. **Fletcher**. Mr. Chairman, we haven't finished our study on the science missions yet, so I don't think we can provide that for the record until that study is completed.

LIFEBOAT

Senator **Proxmire**. How about a lifeboat that could safely return astronauts from the station to the Earth in an emergency? Is this in your plans, and how much would it cost in current year dollars?

Dr. **Fletcher**. Mr. Chairman, we haven't really decided to go for a lifeboat. That would be required for the permanent manned capability. Although there are other ideas being considered, if we decide to go for the lifeboat, nevertheless, we are just starting phase B. As such, I'm going to have to give you a very approximate estimate because we haven't completed phase B. It would be on the order of $800 million. I think that's a very early guess. It could be less or it could be more.

TOTAL COST OF STATION THROUGH YEAR 2000

Senator **Proxmire**. For the record, would you put all these costs together and provide the total cost of the station through the year 2000, as well as a yearly breakdown of those costs? I realize it's all hypothetical, but you know the function of this committee is a money function. We appropriate the money and we should know what we're doing and where we're going. And I realize it is difficult. And you can put in whatever caveats you want of how we should assess these figures. But if you could give us the best you can, I think it would be very helpful to the committee.

Dr. **Fletcher**. Mr. Chairman, I think we can give you the best estimate we have on the R&D cost and the cost to assemble. Operational costs are a different kind of thing. You don't estimate the operational cost of a factory until you decide what to put in the factory.

Senator **Proxmire**. Certainly, if you're any kind of a businessman and you're not going to go belly up in a hurry, you know pretty much what that factory is going to cost you to operate. Either that or you don't build it.

Dr. FLETCHER. But each project is a different cost that you put in a factory. You estimate the cost of that product or projects on an item-by-item basis. If you could fully occupy the space station, in other words, you kept the capability going forever, the cost would be infinite, of course.

Senator PROXMIRE. We're only asking until the year 2000. That's a long time to elections.

Dr. FLETCHER. Once the space station is fully assembled in its entirety, we can provide an estimate of what the annual cost would be, if it's fully occupied. That's a normal way to estimate the cost of a new facility. We can provide that answer.

Senator PROXMIRE. Does that indicate you don't know what the station is going to be or how you will use the station?

Dr. FLETCHER. We don't know how long a lifetime the station is going to have; it could be forever.

Senator PROXMIRE. Well, what do we ask for in the next 13 years?

Dr. FLETCHER. You could do it in the 13 years or 5 years, but the best thing to do is to ask for the cost per year.

Senator PROXMIRE. Well, you see that is not the best response. We have to be more responsive, we have to tell the Congress how much it's going to cost over the years, so they'll know what's coming up. You know, the whole thrust of our getting the deficit under control is to have some firm knowledge over more than a year or two or three of where we're going.

Dr. FLETCHER. I think we can make an estimate for the first several years of the cost of the space station, assuming that it's fully occupied. We do assume the demand is very high and it's fully occupied for the first several years. I think it would be inappropriate at this time to estimate beyond 4 or 5 years.

Senator PROXMIRE. Well, give us the best you can over the year 2000.

Dr. FLETCHER. Fair enough.

SPACE STATION IMPACT ON OTHER SPACE ACTIVITIES

Senator PROXMIRE. Dr. Fletcher, I'd like to take some time at this point to explore with you some of the objections that have been made to the space station as it is presently designed.

On May 1 we will hear from some outside witnesses who are concerned about the station's impact on other space activities, but today I'll raise some of the arguments they might be expected to make, and I would like to have your response.

First, let me refer to the testimony of T.F. Rogers of the Office of Technology Assessment, the testimony he gave before the Senate Commerce Committee's Space Subcommittee in November 1983. In his prepared statement Mr. Rogers made it clear that the station would cost at least $20 billion in 1984 dollars including the operating costs and that the price tag could approach $30 billion by the end of the century.

The statement then went on to say and I quote:

> Under any circumstances we must not allow our core space activities in science, applications and technology development to become unduly burdened by taxes levied upon them to pay for unforeseen costs in such very large hardware programs.
>
> The past year has seen a resurgence of military interest in defense against ballistic missiles. Unless our publicly funded civilian space program has sufficient challenge, not only technological challenge, NASA and the space industry could well yield up too many of its brighter and more competent professionals to military space work. This possibility, in turn, could perhaps presage the crumbling of a fundamental space posture of the United States; that is, we would have a vigorous, publicly supported space program in both the civilian and military areas.

I think that statement summarizes the concern of many that the station will dry up funding for space science and applications, and that the parallel development of the Strategic Defense Initiative will attract many civilian space scientists to the military sector. In fact, some experts tell us this is already happening. What is your response?

Dr. FLETCHER. Mr. Chairman, I think Tom Rogers' point made back in 1983 is valid. We have to be careful, and I hope this committee makes sure that we are careful, to preserve the space science program, even though we go ahead with a space station. The estimates, of course, were made in 1983, but I think they were as good estimates as anybody would make. But still we can't afford to let our space science go wanting because we're building the next phase in our outreach into space.

Senator PROXMIRE. That's the danger, isn't it, we have finite resources and we are operating under a very restrictive overall budget.

Dr. FLETCHER. Mr. Chairman, that's correct. But on the other hand, if you look at the record, we have done rather well in this regard. And, of course, we have been prodded by this committee and others, but over the last 10 years we've maintained a viable space science program on the order of 20 to 25 percent of our total R&D budget. This was the approximate level when I was here the first time. So, we have not slighted the space science program in any major way due to these large programs.

Senator PROXMIRE. Well, those competing costs have been very small compared to what they're very likely to be. Let me read you from Mr. Rogers' 1983 testimony on the need for a comprehensive space agenda, and he said:

> Absent agreement upon such a fundamental agenda, it is not clear that we should even begin to obtain such an expensive space infrastructure. There is little important external demand, and no convincing argument that it can be obtained in a hurry. And the very act of allocating such a large and long-term stream of public dollars in this fashion could well restrict and perhaps even foreclose our ability to provide funds, imagination, and administrative leadership to address exceptionally important national space-related goals, much less alternative goals for public investment.

EXTERNAL DEMAND FOR SPACE STATION

Now, that statement was made over 3 years ago. Could you tell us what external demand currently exists for the space station as presently configured outside of the aerospace industry, which clearly is interested in the dollars to be made on station development? Could you be as specific as possible?

Dr. FLETCHER. Mr. Chairman, there's a vast interest in the space station, both within and without and also by the public. I want to be sure it's understood that one of the purposes of the space station is to take the next step out into space with the permanent manned capability. That's the key to any future programs we want to pursue, whether we go to Mars, the Moon, or any other place in space. We need to have a permanent space station in Earth orbit before you do any of those programs. That is the main purpose of this space station.

In addition, it is going to be used by both commercial and science users, all of whom have signed up for the space station. The microgravity science environment has become particularly attractive among material scientists, among medical scientists and others who want to use microgravity for developing new products and processes.

The Europeans, and Japanese especially, Mr. Chairman, are interested in that, so we have to protect ourselves. One of the concerns with the space station is the assurance that they don't run away with the market in those areas. On the other hand, there will be many scientific experiments which are attached payloads. There will be a coorbiting platform, possibly the Advanced X-Ray Astrophysical Facility [AXAF]. All of these science disciplines are part of the space station. There's a large scientific community that wants the space station to go forward. They want the full station.

SPACE STATION AN INVESTMENT

Senator PROXMIRE. I would like you to make that case as precisely and as specifically as you can. Can you tell us what companies, outside of the aerospace industry, are prepared to invest in this space station, who have the dollars on the line ready to go?

Dr. FLETCHER. We can supply that for the record. I can remember about one or two.

Mr. STOFAN. We can supply it for the record.

[The information follows:]

To date, NASA has negotiated some 39 agreements with companies interested in space applications. Many of these companies had hoped to fly experiments on the Shuttle. Currently, U.S. industry is utilizing NASA ground and airborne facilities in preparation for the commercial use of space. Approximately, 25 percent of the 38 companies have expressed interest in using or participating in the Space Station. (A list of companies with agreements is attached. Those with interest in Space Station are marked with an asterisk).

Although the Space Station is beyond the private sector five (5) year planning horizon, it is clear that industry indeed wants to use the Station for research and development purposes. Access to the long-duration, manned environment of the Station will be critical before industry is prepared to make major investment commitments. In this regard, most companies are reluctant to make their interest known until such time as they are prepared to go public. However, we can estimate a level of investment in the materials area alone to be about $50 million, based on our experience in building materials processing hardware and the level of interest expressed in this area.

We are exploring other areas of applications including remote sensing, life sciences, and industrial services where industry can participate as developer/operator of non-critical elements of the Station. In the future, we plan to continue to work closely with companies such as Space Industries, Inc. and Spacelab and with companies planning to use the Station for a broad spectrum of applications. As the Space Station final design is completed and development is underway, we feel that industry plans will also come into focus, and we will be in a better position to estimate industry involvement.

NASA/INDUSTRY SPACE ACT AGREEMENTS
SIGNED AGREEMENTS*

COMPANY	VENTURE	STATUS
**MDAC	ELECTROPHORESIS OPERATIONS IN SPACE	JEA SIGNED 1/80
**MICROGRAVITY RESEARCH ASSOCIATES	MPS EXPERIMENTS	JEA SIGNED 4/83
ORBITAL SCIENCES CORPORATION (FORMERLY KNOWN AS ORBITAL SYSTEMS CORPORATION)	TOS UPPER STAGE	COOPERATIVE AGREEMENT
FAIRCHILD INDUSTRIES	DEVELOPMENT OF FREE-FLYING PLATFORM	JEA SIGNED 8/83
SPACECO LTD	INSTRUMENTATION FOR MEASUREMENT OF PAYLOAD ENVIRONMENT	JEA SIGNED EARLY 1984
THRESHOLD CORPORATION	FILMING OF IN FLIGHT STS ACTIVITIES (PRODUCTION OF SINGLE 30 MINUTE FILM)	AGREEMENT SIGNED 4/84
DEERE & COMPANY	RESEARCH IN ALLOY FORMATION	TEA SIGNED 6/84
**3M (2 YEAR)	RESEARCH IN ORGANIC AND POLYMER CHEMISTRY	JEA SIGNED 9/84
MARTIN MARIETTA CORPORATION	RESEARCH EVALUATION OF FLUID DYNAMICS DATA AT ZERO-G	JEA SIGNED 10/84
**ROCKWELL CORPORATION	FLUIDS EXPERIMENT APPARATUS	MOU SIGNED 11/84

COMPANY	VENTURE	STATUS
DEFENSE SYSTEMS, INC.	DATA RELAY SATELLITE	AGREEMENT SIGNED 12/84
**BOEING AEROSPACE COMPANY	INDUSTRIAL SPACE PROGRESSING RESEARCH PROGRAM	MOU SIGNED 2/85
**GRUMMAN AEROSPACE CORPORATION	MPS FURNACE EXPERIMENTS	MOU SIGNED 2/85
INSTRUMENTATION TECHNOLOGY ASSOCIATES	STANDARDIZED EXPERIMENTS CARRIER	JEA SIGNED 6/85
**SPACE INDUSTRIES, INC.	INDUSTRIAL SPACE FACILITY	MOU SIGNED 8/85 SPACE SYSTEM DEVELOPMENT AGREEMENT (SSDA) SIGNED 8/85
**SPERRY CORPORATION	MAGNETIC ISOLATION SYSTEM TO BUFFER MPS EXPERIMENTS/ HARDWARE AGAINST VIBRATIONS AND SHOCK	MOU SIGNED 8/29/85
GTE	ORGANIC AND POLYMERIC MICROGRAVITY GROWTH EXPERIMENTS	MOU SIGNED 9/85
SCOTT SCIENCE AND TECHNOLOGIES, INC.	RECOVERABLE UPPER STAGE LIQUID-PROPELLED VEHICLE (2K TO 19K LBS. TO GEO TRANSFER)	MOA SIGNED 10/85
GEOSTAR	COMMERCIAL POSITION DETERMINATION AND NONVOICE COMMUNICATION SYSTEM	SSDA SIGNED 11/85
INTERNATIONAL SPACE CORPORATION	MPS HARDWARE AND EXPERIMENTS	JEA SIGNED 12/85
RANTEX	RESEARCH ON RHEUMATOID ARTHRITIS	MOU SIGNED 12/85

COMPANY	VENTURE	STATUS
**SPACEHAB	MODULE TO AUGMENT PRESSURIZED VOLUME OF SHUTTLE FOR COMMERCIAL LEASE TO NASA AND DOD (70%) AND OTHER ENTITIES (30%)	MOU SIGNED 1/86
DAVID A. MOUAT	SATELLITE AND AIRCRAFT REMOTE SENSING FOR GEOBOTANY AND MINERAL AND HYDROCARBON EXPLORATION	TEA SIGNED 2/86
INSTITUTE FOR TECHNOLOGY DEVELOPMENT (ITD)	COMMERCIAL REMOTE SENSING TECHNOLOGY	MOA SIGNED 3/86
EARTH DATA CORPORATION	COMMERCIAL REMOTE SENSING SYSTEM	TEA SIGNED 3/86
**ROCKWELL CORPORATION	COLLABORATIVE MATERIALS SCIENCE GROUND-BASED INVESTIGATIONS WITH MSFC	TEA SIGNED 4/86
**BOEING AEROSPACE CORPORATION	CONDUCTING EXPERIMENTS IN CRYSTAL GROWTH IN THE SPACE SHUTTLE	JEA SIGNED 5/86
NSTL - UNION OIL CORPORATION	RESEARCH PROJECT TO DEVELOP AND TEST SPACE CERTIFIED REMOTE SENSING INSTRUMENT	MOU SIGNED BY NASA 5/86
ABEX CORPORATION	COLLABORATE LOW-G MATERIALS SCIENCE EXPERIMENTS WITH MSFC USING KC-135 AND MSFC DIRECTIONAL SOLIDIFICATION FURNACE	TEA SIGNED BY NASA 5/86
**3M	GROUND-BASED LOW-G EXPERIMENTS ON POLYMERIC MATERIALS USING MSFC FACILITIES	TEA SIGNED 7/86

COMPANY	VENTURE	STATUS
SPACE SERVICES, INC.	USE OF WALLOPS AS LAUNCH SITE FOR ELV OPERATIONS	MOA SIGNED 9/86
GENERAL DYNAMICS	PRIVATE OPERATION OF ATLAS/ CENTAUR LAUNCH VEHICLES	AGREEMENT SIGNED 3/87
**GENERAL SPACE CORPORATION	DEVELOPMENT OF A COMMERCIAL ORBITING POWER SOURCE (POWERCRAFT)	MOU SIGNED 10/86
HERCULES AEROSPACE COMPANY	GROUND-BASED LOW-G EXPERIMENTS ON POLYMERIC MATERIALS USING MSFC AND LeRC FACILITIES	TEA SIGNED 11/86
3M (10 YEAR)	SPACE RESEARCH IN ORGANIC AND POLYMER CHEMISTRY	JEA SIGNED 12/86
ROCKWELL CORPORATION	FLOATING ZONE CRYSTAL GROWTH RESEARCH IN LOW-G	JEA SIGNED 3/87

*Twenty-one (21) Industrial Guest Investigator (IGI) Agreements, that may or may not have commercial application, are not included in this list.

**Companies expressing interest in using the Space Station.

Senator PROXMIRE. Well, that "Supply it for the record" sounds as if you don't have that available.

Dr. FLETCHER. Well, we have a pharmaceutical company, but I wouldn't want to give the wrong name for a pharmaceutical company. Electronic companies. I just think it would be wrong to guess at it right now without having the whole situation put before us.

Senator PROXMIRE. Well, then, without telling me precisely what the names of the companies are, can you give me some notion of how many there are, and how big of an investment they stand ready to make, roughly?

Dr. FLETCHER. I think we can do that for the record.

Senator PROXMIRE. You can't do that off your head despite the fact that we have some of these great experts here?

Mr. MYERS. Mr. Chairman, we have 56 agreements with private companies.

Senator PROXMIRE. Fifty-six agreements.

Mr. MYERS. Dealing with activities leading to operations on the space station.

Senator PROXMIRE. These are nonaerospace companies?

Mr. MYERS. It's a mixture.

Senator PROXMIRE. Well, what proportion are aerospace and what proportion are not?

Mr. MYERS. It's about 50/50.

Senator PROXMIRE. And about how much of the 50 are not aerospace; roughly, how much would that likely be to engender in hundreds of millions or billions of dollars of investment?

Mr. MYERS. That's what the space station activity is really all about, Mr. Chairman. It gives the opportunity for research, first, to be done on the ground, then on the space station which, in turn, could lead to long-term manufacturing operations.

I think the idea of the space station as a research tool to develop those kind of activities, and they in turn will grow either as a part of the space station or become independent laboratories in space for production of materials.

MAN-TENDED FACILITY

Senator PROXMIRE. I'd like to discuss with you briefly the concept of developing an inexpensive man-tended space facility as an incremental step toward a permanently manned station.

I'm going to refer specifically to a concept being advanced by a Houston firm, Space Industries Inc., not because I think they have the only answers but because they have illustrated the private sector's willingness to invest in a modest incremental approach.

The firm projects a launch date of at least 1990, I should say of late 1990, given adequate federal user commitments by the end of the current year. Now, those commitments would cost less than $200 million a year, and the firm would build an industrial space facility between $300 million and $400 million using private sector funds and buy launch services under a long-term contract, as I understand it.

This would give us some experience in the use of space for microgravity experiments, experience that could be used to design a fully responsive permanently manned station. I realize the firm plans to work with you as an adjunct to your permanently manned $15 billion station and is not proposing its industrial space facility as an alternative.

But why shouldn't we put up this kind of man-tended facility in 1990 and see how useful it is rather than committing ourselves to a huge investment and huge operating costs without any significant experience in the use of microgravity environment?

Dr. Fletcher. Mr. Chairman, we fully support the industrial space facility, and it is an adjunct, at least initially, to the space shuttle. There are a number of commercial people, many of them foreign, that have signed up for that space facility. It is a potential precursor and prelude to what the space station would do. It will not do everything that the space station will do, as you have properly pointed out. It is man tended.

Many microgravity experiments require human presence to change out the experiments, to observe the results, make changes, and so forth. Many of these microgravity experiments can only be accomplished through human presence.

Right now we are doing some of this on a very short duration situation; that is, a space shuttle will orbit for 4 or 5 days, with a spacelab payload, which is a man-tended microgravity facility. We have a number of those spacelab missions planned. But in a long duration situation for 3 months at a time, we really need a space station to move forward. Both the industrial space facility, which is proposed by the Houston company that you mentioned, and a space station are both needed to conduct extended duration microgravity science.

Senator Proxmire. Well, you see, the hesitation I have on this is, what's the rush, why such a hurry? We're not talking about a desperate race against the Soviet Union for military parity or anything of that kind. We're talking about a situation in which space will be there a long time, and the planets will be there for a long, long time, and we are going to do this in a measured and deliberate and careful as well as a prudent economic way.

Dr. Fletcher. I agree we should do it in a careful, measured and prudent economical way, and I believe that's what we're doing, Mr. Chairman.

I should quickly add that we started this whole race, if you want to call it that, back in the Skylab days. NASA had the Skylab in orbit and demonstrated what could be done in the presence of zero gravity, as we called it then. It's microgravity now.

We produced many new products which could not have been produced on Earth at that time. That stimulated significant national and international interest in the microgravity research program. It's a fundamental new branch of science. And that's why the urgency to get on with it. An early piece of that will be the industrial space facility that you mentioned.

OTA REPORT

Senator PROXMIRE. I want to note that Senator Grassley was here, he had a question that he would like to ask for the record, and unfortunately he had to leave. He'll be back if he can.

In November 1984 the Office of Technology Assessment [OTA] came out with a report that discussed lower cost, more incremental approaches to the space station as now planned. Now, I'd like to explore two of those approaches with you.

First, OTA suggested that for $300 million a year, within 5 years we could develop an extended duration shuttle orbiter plus several platforms. Over 10 years the investment could produce the first permanently orbiting, spacelab-derived habitable modules in low Earth orbit that could support three people, an orbital maneuvering vehicle, allowing the servicing of nearby satellites, and a few free-flying platforms. In 15 years this investment could produce two free-flying spacelabs, one in polar orbit or a much more capable permanent infrastructure in low Earth orbit.

My question is, did you consider this kind of approach and discard it or was it never given serious consideration?

Dr. FLETCHER. Mr. Chairman, I was somewhat involved in that study and I have my own bias, but I think Andy Stofan has more recently gone over the subject and he can answer it.

Senator PROXMIRE. Mr. Stofan.

Mr. STOFAN. We have looked at this study and we have looked at the report, and essentially there were three points made. One, we kept referring to the report on infrastructure, that was somewhat vague and not specific. And again, what is the exact purpose; what's the science; what's the technology; what are the reasons we would go forth?

Second, the statement was made in the report that there was no compelling reason to proceed with the space station, and I think Dr. Fletcher has addressed that.

Senator PROXMIRE. Well, before you go ahead let me say I think this was pretty specific, they had a specific amount of money, $300 million; a specific time, in 5 years, then 10 years, then 15 years. They said precisely what they thought it would develop. They said the numbers could support three people, an orbital maneuvering vehicle, allowing the servicing of nearby satellites, free flying platforms, and so forth.

Mr. STOFAN. But again, for what purpose? What scientific or technical problem are they solving with each element? Is it life sciences? Is it observational science? Is it materials processing?

The space station has been designed for a set of requirements that came out of the science, commercial, and technology world. So, it's designed to solve a specific thing rather than just put up a whole series of things in space.

SPACE STATION LAUNCH RATE

Senator PROXMIRE. Now, Dr. Fletcher, the chart accompanying your report on the space station launch rate, the space station program plan shows 16 shuttle launches with 6 launches being necessary to get you to a man-tended mode, which would occur in early 1994 if there are no shuttle induced delays or hitches in the development of the space station hardware; is that correct?

Dr. FLETCHER. That is correct, Mr. Chairman.

Senator PROXMIRE. According to a February note in Aerospace Daily, you were expecting a 51,000-pound capability for the shuttle orbiter when it resumes flights next year with an increase to 54,000 or 55,000 pounds in 1989, and maybe 58,000 pounds later; is that correct?

Dr. FLETCHER. Well, we have a number of suggestions and Admiral Truly may want to respond more precisely, to improve the payload capability back to the 65,000 pounds that it was originally designed for. I'm not sure when that capability would be available. We would hope it would be approximately 3 or 4 years from now. Am I on the right track, Admiral Truly?

Admiral TRULY. Yes, sir; we believe the shuttle capability out of the Kennedy Space Center when we get flying again will be 55,000 pounds. We do have potential performance enhancements that are proposed that would regain the total original performance projections in the early 1990's.

Senator PROXMIRE. I want to make sure I understand. Does your estimate of six launches to achieve a man-tended capability assume an orbiter can carry 65,000 pounds that it was designed for or are you assuming a lesser capacity?

Dr. FLETCHER. I'm sorry, Mr. Chairman, I misunderstood the thrust of your question. No, we do not need the full 65,000 pounds; 50,000 pounds would be adequate for the space station.

ROBOTIC VERSUS HUMAN DEPENDENCY

Senator PROXMIRE. Now, there is a natural competitiveness between human versus automated control of space equipment, with an apparent slant toward human dependence, even in cases where a robotic solution may be more appropriate. Can you explain how you take the cost into consideration when making tradeoffs between robotic versus human-supported designs?

Dr. FLETCHER. Well, the tradeoffs—other people have gone into this more thoroughly than I have, but you can't make a direct tradeoff in principle for anything that a person can do in space that's routine. You can develop a robot to do the same thing.

The reason a person is there is to deal with the unexpected. The things that you can't foresee in advance and there are many instances where a man's presence made the difference between successful science experiments and unsuccessful ones.

We don't make a tradeoff in dollars; all we do is make a statement that there are some things that require a human presence. For example, NASA has not attempted to estimate what the cost would be of having a robot tend the space telescope. It's almost incomprehensible to determine how a robot would move up to space and attach itself to the space telescope, unscrew the screws of the instrument package that needs to be changed, put in a new instrument package and so forth. That type of scenario would not be seriously considered.

Senator PROXMIRE. Well, that seems to me to be the kind of thing that a robot could do. Let me pursue this a little further.

I understand that the dependence on human controls is so great that it isn't even possible to lower the landing gear of a shuttle unless a human pushes a button. In other words, we can land a vehicle on Mars without people, but we can't do the same here on Earth. Is there some cost-effectiveness in having these tasks done by humans?

Dr. FLETCHER. I think the statement is slightly inaccurate about the wheels not being able to be put down except by the astronaut. We have the capability of landing the space shuttle without human presence. We have never used that capability because we don't want to risk the loss of the vehicle, but it is capable of landing automatically, Mr. Chairman.

SHUTTLE-DERIVED VEHICLE

Senator PROXMIRE. Now, you are requesting $568 million in fiscal year 1988 for space transportation capability development, including $24.9 million for space transportation system advanced programs. Pages 2 to 16 of your justification indicates that you are spending $11 million under this heading in 1987 to continue joint NASA/DOD studies on future launch vehicle requirements. Does that project have to do with the so-called shuttle-derived heavy-lift launch vehicle?

Dr. FLETCHER. There is an amount of money in that estimate that deals with shuttle-derived vehicles. It's on the order of $5 million, Mr. Chairman.

Senator PROXMIRE. And how much is the Department of Defense spending in that area currently?

Dr. FLETCHER. We don't have an accurate estimate of that, but the part that they are involved in, and that is joint with NASA, is approximately that figure.

Tommy, do you have the exact figure for DOD?

Mr. MYERS. It's my understanding that the study was started about a year ago and will be completed at the end of this year; it was $5 million for each of the four contractors. So, DOD would have about $10 million in that program.

Senator PROXMIRE. DOD puts in $10 million and NASA puts in $5 million; is that right?

Mr. MYERS. Yes. Now, in addition to that there are technology programs within NASA and DOD that would relate to the elements that apply to heavy-lift launch vehicles in the future.

HEAVY-LIFT LAUNCH VEHICLE STRATEGY

Senator PROXMIRE. Can you tell us what your long-term heavy-lift vehicle strategy is, and how much that strategy would cost? I'm particularly interested in costs over the next 5 years.

Dr. FLETCHER. Mr. Chairman, we have not developed a strategy that's well defined enough that we can present to you today. I can give you a sketch of what the heavy-lift launch vehicle would do for NASA, but DOD has its own requirements. But let me see if I can sketch that out without giving you specific plans, because we have not finished that study yet.

The first use of the shuttle-derived launch vehicle, as we call it, which is an early version of the heavy-lift launch vehicle, could be used to assemble the space station, particularly in the block II as we refer to it. You can put larger chunks in the heavy-lift launch vehicle, and therefore, it reduces a number of the shuttle flights required.

In later phases you can actually do experiments having to do with long duration manned flights, much more efficiently with a larger habitable module which would take the place of the small one that is designed for the block I.

In addition, the heavy-lift launch vehicle for NASA would probably be a much more economical way of getting to the planets. We have a number of planetary programs and are depending primarily on the Defense Department to supply those launch vehicles to us, especially in the early phases.

If we have a heavy-lift launch vehicle, you could launch the currently planned planetary missions more efficiently, but also a lot more of them and at less cost.

That's all in the out-years, Mr. Chairman. But basically, the heavy-lift launch vehicle for one-way missions is probably a less expensive way to get into space than the space shuttle.

HEAVY-LIFT VEHICLE WEIGHT

Senator PROXMIRE. Now, as I understand it, the heavy-lift vehicle weight to be put into orbit would be about 150,000 pounds?

Dr. FLETCHER. That's a first cut at it, Mr. Chairman. That's what we have been using. It could be 200,000 pounds, depending on what you do, how you do it, depending on how many engines, for example, you put on the cargo carrying device, if it's two or three or so forth, but it's in the ballpark.

RESTARTING SATURN V PRODUCTION LINE

Senator PROXMIRE. Now, the reason I bring it up is that the Saturn rocket, which was used to launch Skylab back in 1972, was capable of lifting 280,000 pounds to 100 nautical miles. And my question is, has any consideration been given to modifying the Saturn to take account of advances in technology since the early 1970's instead of proceeding with a brand new technology that will cost at least $1 billion to develop?

Dr. FLETCHER. Yes, Mr. Chairman. It was considered for about 5 minutes when I first returned to NASA, and they reminded me that the cost of restarting the Saturn V production line would be many billions of dollars. We have, I think, one full Saturn V left, but I would guess it would take hundreds of millions of dollars just to refurbish that one. So, we really gave up, in all seriousness, Mr. Chairman, the Saturn production line because it was costing in those years dollars about $250 million a flight.

Senator PROXMIRE. I don't want to delay your testimony, but just for the record it would be interesting to me to have you explain why the established technology which is already 16 years old or 15 years old would take so much more than the new technology to develop. That's very puzzling.

Dr. FLETCHER. We could supply it for the record, but I must say, I asked the same question when I first came back, but it's really not in the ball park.

[The information follows:]

Our studies over the recent two years within NASA and in cooperation with the DOD have focused on the need for additional launch capacity including very reliable larger lift capability beginning in the early/mid nineties, and significant improvement in transportation costs during the nineties.

New heavy lift launch vehicle capability can be brought on line in the 1993 to 2000 year timeframe through several mechanisms. These include: (1) New technology vehicles such as the Advanced Launch System; (2) Shuttle or Titan derived vehicles; or (3) Saturn design and technology vehicles.

New technology vehicles offer the more significant potential for major operations cost reductions; however, they clearly require somewhat larger development resources and have projected readiness dates of mid-to-late 1990's. The derivative vehicles offer very significant early capabilities with relatively smaller development costs and the potential to benefit from the base operations costs of the systems from which they are derived. Major new capability improvements look practical with the Shuttle derived type heavy lift beginning in the 1993/94 timeframe, offering significant reduction in costs. The Titan is, of course, already being evolved to a new capability level (Titan IV) in the later 1980's.

Saturn design and technology represents potential good capabilities in the 100-200+K pounds to orbit range; however, development and capacity costs as well as operating costs are estimated to be twice or more than that for a Shuttle derived vehicle. This trend results from the rebuilding of facilities and tooling, the technology in the hardware, and the fully expendable character of the system.

Shuttle and Titan derived vehicles can operate from existing facilities at the launch sites. The previous Saturn launch facilities have been converted to accommodate Shuttle launches, and Saturn vehicles would require large-scale facility modifications and separate/parallel operations. Tooling and production capability for Saturn vehicles no longer exist, and would have to be reestablished. Shuttle derived vehicles, on the other hand, can utilize Shuttle elements from ongoing production lines.

Heavy-lift capability for the Nation can be provided by utilizing the production capabilities, launch facilities and support operations already in being for the Space Shuttle (Shuttle derived vehicles), rather than invest in reestablishing separate and parallel capabilities for other vehicles, including Saturn vehicles. New or improved technologies in propulsion, recovery/reuse and in other areas can be adapted as they become available and as traffic levels warrant, to achieve lower cost operations later in the 1990's.

HEAVY-LIFT LAUNCH VEHICLE

Senator PROXMIRE. Now, Dr. Fletcher, I'd like to summarize the current heavy-lift launch vehicle situation as I see it. You tell me if I'm right or wrong.

The Strategic Defense Initiative Organization wants a heavy-lift launch vehicle that can cut the costs of lifting material into space from the present level of $3,000 a pound to between $200 and $400 a pound. Such a vehicle is needed to meet the Strategic Defense Initiative's goal of launching 5 million pounds of material per year into space by the late 1990's.

The Air Force plans to spend billions of dollars to develop this capability but has no intention at present of designing such a launch vehicle with NASA's goals in mind. If NASA should be able to use the vehicle, that will be a nice added bonus, but NASA is not involved in the planning or development phase to make sure that the launches will be compatible with space station needs or other NASA goals.

Is that an accurate summation of the situation as it presently stands?

Dr. FLETCHER. Mr. Chairman, I believe it's not quite fair, because we have a joint study with the Air Force. And as a matter of fact, we have a joint requirement document that we're preparing. I think it's fair to say that for the heavy-lift launch vehicle that we foresee in the late 1990's, it is going to be designed both for NASA and DOD use.

Mr. Myers, has been involved in those negotiations, and we haven't signed up on the design of that vehicle yet, but we have signed up for the kinds of technology required. It is a joint study with the Defense Department.

Do you want to comment?

Mr. MYERS. Yes. I've had several meetings with the representatives of the SDI program and the Air Force, and we have been exchanging ideas on what the requirements should be for the heavy-lift launch vehicle. That activity is not complete, but it is an ongoing definition of a national launch capability.

Senator PROXMIRE. Now, Dr. Fletcher, my staff and Senator Johnston's staff yesterday released our second annual SDI report, and I spoke on it this morning on the floor of the Senate. In it we note that based on the Air Force figures supplied to our staffs, U.S. space launch requirements without SDI would run at about 750 kilograms per year beginning in 1995. Our study notes that we could meet those requirements, and I quote, "Simply by adding to the U.S. fleet more of the present space vehicles." But, if we add the requirement of orbiting all these space-based kill vehicles, kinetic kill vehicles, in early deployment of SDI, the Air Force said we would need to launch about 2 million kilograms. Now, that's about two and one-half times what was calculated before annually. And to do that we would need the heavy-lift launch vehicle.

Isn't that assessment from the Air Force correct?

Dr. FLETCHER. I'm not sure anybody here has those figures.That's part of the ongoing study. We don't have those figures; they exist in our files somewhere, but we only know what NASA's requirements are off the top of our head, not the Air Force's.

Senator PROXMIRE. You could do without the heavy-lift vehicles?

Dr. FLETCHER. Not in the long term, Mr. Chairman. We need to have the heavy-lift launch vehicle for whatever we do beyond the space station. If we decide, as you and I have discussed, to someday have a joint mission with the Russians to Mars, there's only one way to do that and that's to have a heavy-lift launch vehicle.

STRATEGIC DEFENSE INITIATIVE

Senator PROXMIRE. In the short term, the main reason for pursuing a heavy-lift launch vehicle is to satisfy the SDI's space transportation requirements?

Dr. FLETCHER. No. The short term, you have to distinguish between the late 1990's, which is the long term and which is the study we are doing with the Defense Department. In the short term, we could use a shuttle-derived vehicle as early as possible if we could afford the development costs. The shuttle-derived vehicle could be used as I described earlier for assembling the block II phase of the space station and also resupplying the space station in the mid-1990's. That would be a NASA requirement, not necessarily an SDI requirement.

Senator PROXMIRE. Well, I can tell you, if we're serious about SDI deploying and applying SDI figures, particularly from the point of SDI, as the administration seemed to indicate, particularly in the next decade that's going to use up all the capacity of the heavy-lift vehicle. There won't be much left for you, if any.

Dr. FLETCHER. If we develop it, Mr. Chairman——

Senator PROXMIRE. They will take it.

Dr. FLETCHER. They will only get their fair share; they will not get any larger share.

Senator PROXMIRE. Good luck.

As you know, the administration has made SDI their No. 1 military priority, and while NASA has great affection and support from all of us, especially the administration, it seems to me that when it comes to the SDI versus NASA, you're going to come out second.

If you really wanted to develop the cheapest space transportation for this country, should NASA be the lead agency to develop any kind of heavy-lift launch capacity? After all, isn't all the rocket expertise to accomplish this in NASA?

Dr. FLETCHER. Mr. Chairman, from my point of view, that's absolutely correct. But I think it's not only less expensive, but it's more reliable than is required for both NASA and DOD. We know how to do that, and we have been doing it for many years. I think we are the experts, Mr. Chairman.

I might add that I might be a little biased in that regard.

SHUTTLE FLIGHT RESUMPTION

Senator PROXMIRE. Now, you are requesting $3.1 billion in 1988 for the space transportation systems program. If we delete the one-time cost of a fourth orbiter from your current budget, that represents an increase of $263 million over your current budget.

Although you indicated in your opening statement that you plan to resume shuttle flights in February of next year, you qualify that statement with the words, "If at that time we are ready to commit to a safe flight."

All the indicators point to a significant delay in the February 18 launch date. Rick Hauck, commander of the next shuttle flight, said in January it would be very difficult to make. John Young, your chief astronaut, was quoted by the Houston Chronicle on March 19 as saying, "It sure ain't gonna be February. If it were to be in February we'd leave a lot of things out." Young talked of NASA managers who won't admit they are having problems with the shuttle's redesign.

If you were a betting man, what would you say are the odds that you would meet the February launch date?

Dr. FLETCHER. I don't like to bet, Mr. Chairman, in public.

Senator PROXMIRE. I'm not asking you to bet in public, because you won't lose a nickel, you might lose something else but you won't lose a nickel.

Dr. FLETCHER. It is fair to say there are a number of threats to that February launch date, but at the moment we have decided to maintain that date. That's the only way to run a program, Mr. Chairman. You can't just keep slipping it based on speculation. You look at what you have to do by a certain time. You look at what the threats are, and you try to deal with those threats the best you can. And when you see that you can't work around all the threats to the schedule, then you're slipping. And I say there are a great many threats to that program.

THREATS TO FEBRUARY LAUNCH DATE

Senator PROXMIRE. Well, then let me ask you this. When is your next decision date with regard to the February launch, and what factors will you be considering as to whether you can keep it or not?

Dr. FLETCHER. I'd like to turn to Admiral Truly to answer that question.

Admiral TRULY. Yes, sir. Mr. Chairman, we are presently assessing the schedule threats. They come generally in two directions. First, in the technical threats and in testing that we're going to have to accomplish in full-scale; that is, solid rocket motor firings. This will have to be done prior to the first flight which is dependent on a finite amount of test facilities that we now have; that is, a single test stand in Utah and a second we are building. That is the principal schedule driver from a technical point of view.

The second area that is threatening the schedule is the suggestion for additional content. For example, we are assessing a proposal to do a flight readiness firing prior to the manned flight. We are looking at other things that in themselves would add a few weeks or a couple months to the schedule.

In amplifying Dr. Fletcher's remarks, the schedule has always been tight and now what reserve we had in it is essentially gone. We're reassessing the schedule. But I anticipate the schedule adjustment, if we have to make one, will be measured in weeks or a few months. It certainly won't be in years.

Senator PROXMIRE. Well, my question is, when will you make a decision to go or not go on the February 1988 date?

Admiral TRULY. We are assessing within the program these threats. I think it will probably be the end of the next couple of months. I personally would like to see us get to the first of the series of full-scale motor firings, because when we get to that firing, that in itself triggers a finite amount of turnaround time and assuming we have success in those tests, would define the earliest flight date that we can safely meet.

SHUTTLE PRODUCTION AND OPERATIONS BUDGET

Senator PROXMIRE. Now, Dr. Fletcher, I understand you have received indications from the field that your 1988 shuttle production and operations budgets may each be from $100 million to $200 million too low.

Can you tell us if this is the case, and if so, how do you plan to deal with that situation?

Dr. FLETCHER. The numbers are approximately correct, Mr. Chairman. I don't remember the exact numbers because these are numbers that came in from the various centers on what they felt they needed. We are still massaging those numbers, so we don't have any precise numbers. We expect to have a better cut at this in about 6 weeks or so, Mr. Chairman. But indeed, we are getting a little tight on the costs to begin to fly the shuttle again and operate it safely.

Senator PROXMIRE. Have you tried to absorb that in some other programs or are you going to ask for a supplemental?

Dr. FLETCHER. We haven't made that decision yet, Mr. Chairman. There are going to be some hard choices ahead.

NRC'S RECOMMENDATIONS ON REDESIGN OF SRB'S

Senator PROXMIRE. You're requesting a space transportation propulsion systems budget of $552 million next year, an increase of about $88 million above the current budget. Your request includes $140 million for solid rocket booster activities, including redesign.

As you know, in January a National Research Council panel on the redesign of the solid rocket booster sent you an interim report that made a number of suggestions. I'd like to go over some of those recommendations with you.

MODIFICATIONS OF BASELINE DESIGN

First, the panel faulted NASA for not planning for contingencies, saying your test program was success oriented with little room in the schedule for modifying your baseline design if your tests don't produce the expected results. The panel recommended that you strengthen your contingency plans for incorporating alternatives into the program. Have you followed that recommendation?

Dr. FLETCHER. Yes, Mr. Chairman. That's a very capable committee, and we pay attention. Just like Paine Webber, when they speak, we listen.

Senator PROXMIRE. Well, that's a good plug for Paine Webber. I think they ought to pay for that.

Dr. FLETCHER. Yes; we take their recommendations in that last report seriously. They have other recommendations as well. They have even made some suggestions as to what those alternatives might be. In addition, that they even provide some of the expertise on their panel that helps us over some of these humps.

CASE FIELD JOINT

Senator PROXMIRE. Now, the panel suggested that your contingency planning include the design, fabrication, and testing of a case field joint that closes under pressurization. Will you implement that suggestion?

Dr. FLETCHER. I'll have to turn to Admiral Truly for that one.

Admiral TRULY. We have worked with the panel and they understand and agree with our baseline design. We have ordered four teams that would allow a look at some of the long-term alternative designs, and we have taken that suggestion from the panel.

CASE-TO-NOZZLE JOINT

Senator PROXMIRE. Now, the panel pointed out that there was no real alternative in the program for the baseline design of the case-to-nozzle joint despite the fact that this design created complex stress patterns and potential leak paths. They recommended the establishment of alternatives and placing special emphasis on early, meaningful tests of the design. How have you responded to this suggestion?

Dr. FLETCHER. I think so, Mr. Chairman. I think Admiral Truly can better answer that.

Admiral TRULY. Again, we have a baseline case-to-nozzle design that they're aware of. However, they are looking at alternative designs. They have agreed with us that the appropriate thing for us to be doing is to get into a heavy and definitized test program with the redesigned case-to-nozzle joint so that we can predict test results prior to the test, and then verify them after the test to certify and qualify the system for flight.

SOLID ROCKET BOOSTERS LOAD ESTIMATES

Senator PROXMIRE. Also, the panel commented on reports of changes in solid rocket booster load estimates and cited these reestimates as well as a crack in the aft skirt during a recent structural test as reasons for a review and possible recalculation of a booster stress analysis. A March 18 Associated Press wire story indicated some analyses have been done and that the current skirt design is marginal at best according to one engineer. Can you tell us what steps you are taking to meet that problem?

Admiral TRULY. Yes. That particular failure was an unexpected failure in a structural test article at the Marshall Space Flight Center several months ago. We have already redesigned the aft skirt and we are doing more. We are taking a look at the structural analysis capability at the Marshall Space Flight Center. We have put together a multicenter analysis team that is analyzing the structural integrity of all the attachments between the solid rocket motor and the shuttle.

Dr. FLETCHER. Mr. Chairman, I think something ought to be added there. That skirt failed, not at the design stress, but at about 20 or 25 percent above the design.

Admiral TRULY. That's right; it failed at 130 percent of the design level.

TESTING OF THE REDESIGNED BOOSTER ROCKETS

Senator PROXMIRE. I'm glad you added that.

On March 22 the New York Times quoted an official at the National Research Council as saying that the program to test the redesigned booster rockets has been pushed way back, in some cases by 4 months; is that true?

Admiral TRULY. I'm not familiar with that. We have recently slipped the first of the full-scale motor firings due to a problem that we found in the subscale test. However, that first firing is an engineering test motor of the *Challenger* design and all full-scale motor firings following that first firing will be of the new flight design.

The first flight design motor is scheduled for, I think, the end of July or August 1. And it is the first of a series of full-scale tests that I mentioned that has to be completed prior to first flight.

Senator PROXMIRE. The same official who commented on delays in testing the redesigned boosters said that the biggest risk was that the boosters were being built before full-scale ground tests could be completed. An editorial in The Orlando Sentinel seemed to make the same point when it indicated that NASA was ordering new rockets before it was certain the rockets could be used because the full-scale testing won't occur until July. How do you respond to that criticism?

Admiral Truly. There's no way to get into testing without building these motors. And it's one of the most long-term structural assembly parts of the orbiter, the case sections are 12 feet in diameter and very long. There's only one manufacturer in the country that is available to make them.

Dr. FLETCHER. I believe it's in Wisconsin, Mr. Chairman.

Admiral TRULY. That's true.

Senator PROXMIRE. Well, let's say that slowly again. I want to be sure of that. Not much happens in Wisconsin. I have noticed Utah several times.

Admiral Truly. The case segments are originally forged in that company.

Senator PROXMIRE. What company is that?

Dr. FLETCHER. It's a company called Ladis.

Senator PROXMIRE. Ladis; sure. I've shaken hands at that gate many times.

Admiral TRULY. And that's the single capability in the country for that size segment. So, in order to get a new design we had to originally order forgings which could be machined later to the final design. In fact, to make a launch on our launch schedule or any time in 1988 or probably 1989, the only proper programmatic way to do it was to order the forgings, and that's what we have done. We have an agreement from the National Research Council Oversight Committee on our design approach. That's the programmatic path that is most prudent, and the one we are following.

MIXED FLEET

Senator PROXMIRE. On page ST-3 of your justifications you indicate that the expendable launch vehicle program is currently totally funded through reimbursements from users and that you are actively pursuing privatization of these systems. However, you indicate in your prepared statement that you are exploring the use of expendable launch vehicles to complement the shuttle in a so-called mixed fleet.

You also state that you are considering the incorporation of this concept, and I quote now, "Within the funding envelope proposed in the 1988 budget."

Does that mean that if you decided to buy expendables next year you would have to make offsetting cuts in other programs?

Dr. FLETCHER. Mr. Chairman, we have already ordered one expendable launch vehicle, the Delta launch vehicle for the COBE mission. That was done in fiscal 1987. If we ordered additional launch vehicles, it is not clear that we will need dollars in fiscal year 1988 because it is also possible that we could order those out of the year cost budget, but we would have to have specific authority from Congress to do that.

Right now we haven't presented to the Congress our entire plan for a mixed fleet, as you mentioned. And we plan to have that available though in the next 6 to 8 weeks.

Senator PROXMIRE. Now, the Congressional Budget Office has estimated that providing expendable launch vehicles over the next 5 years for the purpose of meeting the goals of your preshuttle accident program would cost from $700 million for nine payloads to $2.3 billion for 26 payloads. Have you given any thought as to how you would fit these acquisitions into your 5-year budget envelope?.

Mr. MYERS. Mr. Chairman, we have been looking at a mixed fleet for supplementing the shuttle, and the activities associated with the issues of buying hardware that's presently under production such as TITAN IV or the MLV's through our arrangement with the Air Force for launch services, as has been the case for previous operations. The idea then becomes one of building it to a place where we can go to the commercial launch services in the future. When we put that all together, the requirements in 1987 and 1988 are really quite small if we buy our vehicles through the Air Force for a period of a couple of years and subsequently build into a larger amount in the future. We do not have a full run out of those costs for the support of our general requirements.

Senator PROXMIRE. We're talking about the 5-year cost.

Mr. MYERS. Do you have an estimate for 5 years?

Mr. NEWMAN. If we were to buy the first four vehicles that we have considered, the costs in 1987 and 1988 would be on the order of $15 to $20 million, because we don't have to pay for the hardware under the arrangement until 1989.

Senator PROXMIRE. Well, that's right. We want the cost in 1989, 1990, and 1991.

Mr. NEWMAN. On the order of $75 to $100 million to fiscal year 1989 and it will be $200 to $250 in fiscal 1990 for those vehicles. Those are the initial groups that we have been considering.

Dr. FLETCHER. Mr. Chairman, I think it has to be said that these are the preliminary estimates. We haven't come up with a firm mixed fleet recommendation.

Senator PROXMIRE. Well, I realize that. That's the best estimate you have. And how long have you put that in your 5-year budget envelope?

Dr. FLETCHER. Well, Mr. Newman gave you the numbers for a recommended situation for 1987, 1988, and 1989. Do you want it for 1990 and 1991 as well?

Senator PROXMIRE. No; all I want to know is, how do you plan for working that into your limited budget, if that's a problem?

Dr. FLETCHER. We don't have a plan for doing that at the present time. It's either going to require something else to go, Mr. Chairman, or it's going to require an increase in our budget.

ACQUISITION OF ELV'S

Senator PROXMIRE. OK.

Dr. Fletcher, on March 27, Dr. Thomas Donahue sent me a copy of his letter to you urging the acquisition of expendable launch vehicles to provide a needed element of flexibility for near-term space science launches. In his words this would, and I quote, "Go a long way toward reducing uncertainties and difficulties related to shuttle delays, significantly reduce pressure on the shuttle launch schedule, and protect against single point failures."

Dr. Donahue in his letter to me said that to ensure that scientific spacecraft will be ready for launches was, and I quote, "Clearly an urgent requirement, higher in priority than moving toward a yet poorly defined space station."

My question is, do you concur with Dr. Donahue's assessment of priorities and would you be willing to shift some space station funds into expendable launch vehicle procurement if that were necessary to stay within your overall budget targets?

Dr. FLETCHER. Mr. Chairman, I just became familiar with Professor Donahue's letter the day before yesterday, and I was a little surprised by some of his suggestions in that letter. So, in discussions with Frank Press who is President of the National Academy, and also Chairman of the National Research Council under which Mr. Donahue serves, apparently that was not an authorized letter. That letter represents Mr. Donahue's views and not that of the Academy. I want to make sure that gets on the record.

In terms of his proposal, I think from his point of view, which is primarily planetary science, we ought to move onto expendables completely because for planetary science that's a good way to launch our planetary vehicles. On the other hand, if it were up to the planetary scientists, not all of them, but up to Tom Donahue, at least, he would do away with all the space station and order Titan IV's from the Air Force. I think that's the essence of his proposal.

Senator PROXMIRE. Well, I realize that.

Dr. FLETCHER. That's not shared by his committee or by the National Academy.

Senator PROXMIRE. The thrust of my question is, would you, Dr. Fletcher, be willing to shift some space station funds into expendable launch vehicle procurement if that were necessary to stay within your overall budget targets?

Dr. FLETCHER. I would certainly consider it, Mr. Chairman. I think there's a number of things that go into the formulation of the total NASA budget, and that's certainly one of the things that we would have to look at.

EXPENDABLE LAUNCHES FOR SS&A PROGRAM

Senator PROXMIRE. Now, I understand that the head of your Space Science and Applications Program, Burt Edelson, told the House Space Subcommittee that his office has requested seven expendable launches internally. Where does that request currently stand?

Mr. MYERS. Those estimates were made by the Office of Space Science and Applications, and were brought together with other estimates that had been made by other parts of NASA and folded into the mixed fleet study. They are being continuously worked by the Office of Space Flight where we do our overall studies and balance expenditures.

Dr. FLETCHER. Mr. Chairman, also, that's not inconsistent with what Mr. Newman was trying to relate to you. They are not that far apart.

CAPACITY DEFICIT FOR SHUTTLE FLIGHTS

Senator PROXMIRE. Now, the Advisory Council task force on the study of mixed fleet issues pointed to a capacity deficit of 15 to 16 equivalent shuttle flights for the 3-year period from 1993 through 1995 and pointed out that this was partly a result of space station construction and operational support demands.

Doesn't that mean that the pressures for a mixed fleet over a long term would abate somewhat if we took a less ambitious, incremental approach to putting up a space station?

Dr. FLETCHER. It could, but I think the other side of the coin is, you would be better off with a shuttle-derived vehicle in that period of time, and you can have one available. It's not only desirable but it's cost effective. If you're going to have that many flights in that period of time, and it's likely that we will, it argues for the development of a heavy-lift launch vehicle, which we call a shuttle-derived vehicle, our version of it.

DEVELOPMENT COST OF SDV

Senator PROXMIRE. How much do you think it would cost you to develop that kind of vehicle?

Dr. FLETCHER. We haven't made any estimates except the back-of-the-envelope estimates which run from $1 billion to $2 billion for development. Some people in the industry have estimated as low as $800 million for the development of it.

Senator PROXMIRE. At any rate, you couldn't absorb that in your current budget.

Dr. FLETCHER. I don't want to say we couldn't, but I would say at this point it is not prudent. We have too many other threats to our budget to be able to put that in our budget at this point.

ATLAS-CENTAUR FAILURE

Senator PROXMIRE. Now, 2 weeks ago NASA launched an Atlas-Centaur rocket for the Navy during a lightning storm and it was lost at a cost to the taxpayer of $161 million including $78 million for the rocket and $83 million for the satellite.

I've been told informally that NASA has devices in place that measure electrical activity at various points of your launch complex and that the readings were sufficiently high to have caused postponement of the launch had it been a shuttle launch. Is that the case?

Dr. FLETCHER. Well, Mr. Chairman, the analysis hasn't been completed, or the review hasn't been completed of the Atlas-Centaur failure.

I think it's fair to say, though, that we have had in the past, we may not in the future, had a different set of requirements for expendable launch vehicles than we had for the manned vehicles.

The requirements for the manned vehicles are stringent in the sense that we have a number of stations around the cape which measure the lightning potential. They measure it in kilovolts per meter; that is, thousands of volts per meter. Those stations around the cape area all record those readings continuously. That data was available to the launch director, but his criterion was, if there was no lightning strikes within 5 miles of the launch site, it is safe to launch. That is a much less stringent criteria than we applied to the manned space vehicles. He then launched properly.

Senator PROXMIRE. In hindsight, that information should have caused the cancellation of that flight that caused the loss of $160 million.

Dr. FLETCHER. It's true to say.

Senator PROXMIRE. It would have caused the cancellation of the shuttle launch.

Dr. FLETCHER. It would have caused the cancellation of the shuttle launch. That's correct.

Senator PROXMIRE. Now, after all the difficulties you've had over the last year or so, I'm sure you've been asked this before——

Dr. FLETCHER. We're not going to do it again, Mr. Chairman.

Senator PROXMIRE [continuing]. Why haven't you tightened up your weather condition guidelines? And why didn't you just scrub the Atlas-Titan launch until the weather cleared up?

Dr. FLETCHER. We're not going to fly another one in that lightning atmosphere. I'm speaking for Admiral Truly, maybe he wants to comment.

Senator PROXMIRE. Admiral, do you want to go up in lightning?

Admiral TRULY. No; you're absolutely right. The weather criteria which has been used for all the ELV's at KSC, and not only NASA but the Titan, the Air Force launches have all been worked, and in hindsight I find that the criteria is less restrictive than the shuttle criteria. And in the future, I can't speak for the DOD nor will I guess what the Accident Board will conclude, which is appointed to investigating the accident, but I will assure you that weather criteria for NASA ELVs will be more stringent.

Mr. MYERS. It's interesting to note that that same criteria has been used for many, many years without a problem with lightning. We were struck by lightning on Apollo 12, and that's when we brought all the experts on lightning in the country into the program and reviewed and developed criteria for manned space flight programs and applied a softer requirement for the expendable launch vehicles. We're clearly going to review all of those again.

Senator PROXMIRE. I gather you are going to very cautious in view of the recent experience?

Mr. MYERS. We're going to be very cautious.

HUBBLE SPACE TELESCOPE PROGRAM

Senator PROXMIRE. Now, you plan to spend about $1.5 billion on space science and applications next year with about one-third of the total $567 million being devoted to physics and astronomy, roughly the same as your current physics and astronomy budget.

One of the more exciting projects being funded under the program is the Hubble Space Telescope, for which you're requesting $98 million in fiscal year 1988.

Your current estimate for the development of the telescope plus 1 month of on-orbit checkout is between $1.4 billion and $1.5 billion. That compares with the development estimate of $607 million in 1982, 5 years ago. Some of this cost growth is undoubtedly attributable to inflation, but can you tell us why the estimated cost of the project has more than doubled over the last 5 years when inflation has gone up about 25 percent?

Dr. Fletcher. Yes, Mr. Chairman. I think Sam Keller has been asked that question before and he has the details.

Senator Proxmire. Mr. Keller.

Mr. Keller. Mr. Chairman, as you may recall, we had a major problem with the space telescope almost 5 years ago. At that point in time, it was evident that we had serious technical problems, and we had serious schedule problems. We went back and rebaselined the entire effort. We were very far behind in the work on the optical telescope assembly, the Perkin Elmee Corp. in Connecticut. We were having problems with the ground system development. And as a result of that baselining we reestimated the cost of completion not to exceed $1.2 billion.

At the point in time of the *Challenger* accident, we were projecting a cost to completion of within about $8 or $10 million of that number, and we were essentially on schedule; we're going to come in within those costs. So, there has not been significant cost growth in the last 4 years.

TRACKING AND DATA ACQUISITION COSTS

Senator Proxmire. Now, when you first estimated the costs of tracking and data acquisition connected with the telescope, they were $12.1 million. The current estimate is $67.9 million, a fivefold increase. Why has there been such great cost growth in that aspect of the telescope's support costs?

Mr. Keller. I would have to defer to Dr. Fletcher or to Mr. Aller on that question. It's in his budget, not in the physics and astronomy budget.

Mr. Aller. I think you're referring to what we call the mission control facility at the Goddard Space Flight Center that we have provided for the space telescope. The original cost estimate is in the neighborhood of $10 to 15 million and is presently at $67 million as you stated. The principal reason for that growth has been due to the fact that the facility is basically a computer with significant software. The software is built specifically to meet the requirements of the spacecraft. That software provides commanding to the spacecraft, but it has been the growth in that software due to the changes made in the spacecraft that has caused the cost growth that you referred to.

OPERATIONS, MAINTENANCE, AND REPAIR OF HUBBLE TELESCOPE

Senator Proxmire. An article appearing in Aviation Week indicated the cost of maintaining, refurbishing, operating and periodically upgrading the Hubble telescope would be $200 million per year, about 13 percent of your current space science and applications budget. Do you agree with that estimate? Is that a fair estimate?

Mr. Keller. Mr. Chairman, I believe the $200 million is a little bit high, but it is certainly in the order of magnitude. That is, I assume you mean both operations and maintenance and repair. We have two ongoing lines continuing throughout the whole program.

Senator PROXMIRE. That's right; maintaining, refurbishing, operating, and upgrading.

Mr. KELLER. Yes, sir. I think to understand what we're talking about there, we have in the space telescope program a significant number of costs that would not be in a comparable throwaway spacecraft. For example, in the maintenance and repair area we will fund the production, the checkout of the replacement instruments. We plan every 3 years, as we do a maintenance flight, to change out and upgrade one of the instruments on the telescope.

Now, this is comparable, in effect, to launching a new spacecraft, and rather than launch an entire spacecraft, we'll continue to build instruments. We will, over a period of time, replace the older instruments with these newer, more advanced capabilities. That's a principal cause in that maintenance and repair line.

Another significant deviation from our past practice in the operations line, we fund the Space Telescope Science Institute, which is at the Johns Hopkins University in Baltimore. They act as our agent in funding the investigators who will utilize the telescope. Approximately 30 percent of the operations line downstream is comprised of costs of that nature.

In other programs we fund this out of NASA headquarters in our research line items. While the cost is quite high, by comparison to our past experience, I believe it properly reflects the kind of activity we have here ongoing.

Senator PROXMIRE. Dr. Fletcher, it seems to me you may be getting in trouble here because the space station as currently planned will absorb an increasing proportion of your budget over the next few years. How do you intend to accommodate the added cost in addition to that of operating the Hubble telescope within the budget?

Dr. FLETCHER. It's not only the Hubble space telescope, it's all of our great observatories. We already have funded a Gamma Ray Observatory. It's not quite finished, but it's almost finished, but there will be operational costs associated with that.

The original intention for those two observatories was to maintain it through the space shuttle, although it's possible in the outyears and 1990's, it will be done through the space station. That's all included in the run out of our budget, Mr. Chairman. And the run out of our budget is not—we can give you that, by the way, in constant dollars or inflated dollars, it does not greatly increase the out year costs for NASA. It's on the order of $10 billion a year.

Senator PROXMIRE. These things are beginning to add up. So, it appears that you're going to have a very difficult and, in fact, impossible time to live within your 5-year budget.

Dr. FLETCHER. No; it's all figured into our run out budget. The operation costs of both the telescope and the gamma ray observatory are in our run out and schedule, the same order in fiscal 1988 within 5 percent.

Senator PROXMIRE. Well, the expendables don't seem to be and the shuttle overruns.

Dr. FLETCHER. I'm sorry, I thought you meant the operations cost of the space telescope. In the case of a new expendable, we haven't presented it to Congress yet, and we haven't indicated how we would fund those.

The increase in costs for resolution of the shuttle, again, hasn't been pinned down, so that we can't quantify it in any major way.

The operation cost of the space telescope and Gamma Ray Observatory are known and are estimated and are in the budget.

GALILEO MISSION

Senator PROXMIRE. Now, let me get into the Galileo mission. You are requesting a planetary exploration budget of $307 million in fiscal year 1988, a reduction of $50.9 million below your current budget. This budget includes $55 million in continued funding for a Galileo mission to Jupiter.

You may be interested to know that back in calendar 1979 we held a special hearing on the Galileo program, which was initially scheduled for launch in January 1982 for $295 million in development costs. Those development costs have risen from $295 million to about $900 million and the launch date has been pushed back to 1989 or 1990.

As you say in your prepared statement, Dr. Fletcher, you can provide only three planetary launch opportunities with the shuttle in the 1989 to 1990 timeframe.

What is the impact on the future budgets if the shuttle recovery program hits some snags and Galileo is further delayed?

Dr. FLETCHER. Mr. Chairman, that is a very good question, because we'll have to hold the launch windows for Galileo in 1989—October or thereabouts in 1989. We will have to do some juggling if the space shuttle slips, to be sure we hold that date on the manifest. But nevertheless, it's crucially important that the Galileo get launched on that particular date, that we don't miss that launch window. I think it's approximately a 2-year delay before we can launch again. We don't plan to miss that date.

PLANETARY BUDGET CUTS

Senator PROXMIRE. I understand that the Gramm-Rudman budget cuts came primarily from planetary program reserves and that you have inadequate reserves to accommodate any substantial shuttle induced delays; is that the case?

Mr. NEWMAN. The run out budget includes the planetary missions on these current schedules. As far as the annual cost goes, in a case like Galileo, if it does slip, the operation savings are approximately equal to the cost of sustaining the mission on the ground.

In an annual sense, I think the budget does accommodate slips. In the long term, of course, the cost increases as the mission is delayed.

MARS OBSERVER MISSION

Senator PROXMIRE. You plan to spend $29 million on the Mars observer mission next year. As you indicated in your opening statement, Dr. Fletcher, you have decided to postpone the mission from 1990 to 1992 because of the lack of shuttle opportunities.

A project status report on the Mars mission which was submitted to the committee in March of this year indicates that this 2-year delay will add over $110 million to the cost of the mission. Why wouldn't it make sense to use these funds to buy a Titan III launch vehicle and get the Mars mission off the ground in 1990?

Dr. FLETCHER. We have looked very carefully at that option, Mr. Chairman, because all of us wanted to launch in 1990, if it could possibly be done.

One of the reasons we had to delay it, however, is that we had no money in fiscal 1987, which would have been required if we had purchased these vehicles in the normal way. For a while it looked as though it was a possibility that we could get one of the Air Force vehicles, the Titan III, and that opportunity vanished.

So, at this point, we don't see any way to procure a vehicle without coming to you right now and having instant funds available from the Congress for doing it the way you suggest. We simply had no other choice but to delay it until 1992, and it was primarily lack of funds.

COOPERATION WITH SOVIET UNION

Senator PROXMIRE. Senator Matsunaga wrote me earlier this year to point out that a 1990 Mars observer launch would allow us to engage in a coordinated data exchange with the Soviet Union, which is sending a mission to the Mars moon, Phobos. Senator Matsunaga added that it would also allow us to transmit pictures from Mars in 1992 as a part of the International Scientific Year and open the way for a long-term internationally coordinated program of Mars exploration.

As you may know, I am cosponsoring Senator Matsunaga's resolution on that subject. I think it is very important that we cooperate and coordinate in peaceful areas with the Soviet Union as much as we possibly can.

Isn't that one more reason to proceed with the Mars observer mission in 1990 with an expendable launch, especially when it would not increase total mission costs?

Dr. FLETCHER. There's a lot of reasons why we should proceed with an expendable launch vehicle and Mars mission in 1990. On the other hand, I have to refer back to the first point I made and that is, that money has to be made available to do that. I want to quickly add to your two points which are good points. The 1992 launch does not exclude scientific exchange with the Soviet Union. It is not that much different from 1990.

The second point is quite valid. For the year 1992, what some people are sponsoring as the International Space Year, we would not have pictures back or data back from Mars on that week in that year. It would be the year following.

Senator PROXMIRE. I ask Mr. van der Voort to comment.

Mr. VAN DER VOORT. Dr. Fletcher, one idea that has been suggested is that if a corporation is willing to purchase an expendable, it be on a reimbursement basis, and be reimbursed by NASA. Of course, this does apply a commitment of sorts and I suppose it might be in violation somewhat of the Deficiency Act. I just wondered if you folks have looked at that at all.

Dr. FLETCHER. Yes, indeed. Mr. Myers was heavily involved in that activity, and he will explain where we are on that one.

Mr. MYERS. Yes. It sounded like a tremendous idea. We have worked it very hard, and we did find this problem of legislation requirement, changes in legislation required to support that program. The costs again would be, although they would be delayed, in the 1988 time period. So, we have rejected that idea.

ENVIRONMENTAL OBSERVATIONS PROGRAM

Senator PROXMIRE. You're requesting a total of $393 million for your environmental observations program next year, an increase of about $73 million over your current budget. The biggest item in the budget is the upper atmosphere research satellite mission, which is budgeted at $95 million in fiscal year 1988. According to the project status report that you submitted to the committee, the weight of the satellite is currently under review. Can you tell us what that means? Are you having a weight problem—I don't mean you, I mean the satellite?

Dr. FLETCHER. I'm having a weight problem, too, Mr. Chairman.

Senator PROXMIRE. You're looking in great shape.

Dr. FLETCHER. Mr. Keller will answer that.

Mr. KELLER. Yes, Mr. Chairman, we had a weight problem with the satellite in terms of the capacity to put it on orbit and we have presently underway a modification to one of the major experiments on board which has cryogen flight cooling.

The problem was in part caused by the necessity to leave the former hydrogen cryogen because of the shuttle safety. There was a previous plan at the time, we were going to use the Centaur upper stage where we would have vented the hydrogen gas of the explosive out of the orbiter bay. Now, we no longer have that capability. We have had to redesign our experiment. We use a different cryogen, a combination of carbon dioxide and neon, and that has caused a weight problem. We are working on that. We believe we will be able to handle it.

ADVANCED COMMUNICATIONS TECHNOLOGY PROGRAM

Senator PROXMIRE. You're asking $20 million for the space applications communications program next year, that's a reduction of $83 million below your current funding level. Of course, that is due to the fact that you plan to terminate funding for the advanced communications technology program. As you know, we have already spent over $200 million on that program to date and it would take another $200 million or so to complete it. Some have answered that it is inefficient to end a program after it is half completed. How do you respond to that?

Dr. FLETCHER. Well, Mr. Chairman, we've been going back and forth on that particular issue since before my term. Basically, it is an efficient way to fund a program. So far, the White House has felt it prudent not to invest in that particular program. They felt that if it were necessary, commercial industry should fund it.

Senator PROXMIRE. Now, if we terminate that program, would the government have to pay contract liquidation costs and, if so, how expensive would that be?

Dr. FLETCHER. We would have to pay contract liquidation costs. I'm not sure I have the figures in front of me. The exact cost—could I provide that for the record, Mr. Chairman?

[The information follows:]

ADVANCED COMMUNICATIONS SATELLITES

Depending on when the advanced communications technology satellite [ACTS] contracts are terminated, the liability could be $10 to $11 million. In addition, other costs of approximately $20 million would be incurred by the government to liquidate the contracts, such as securing, documenting, and delivering to the government material, equipment, and other items.

NATIONAL AERO-SPACE PROGRAM

Senator PROXMIRE. Yes, sir. You are asking for a total of $690 million for aeronautics and space technology next year, an increase of $99 million above your current budget.

A major new initiative in this area is the national aerospace plane. Your funding for the development of the plane would climb from $45 million to $66 million under your 1988 budget proposal. But that is only the beginning. In 1990 you plan to spend $150 million on that plane.

Do you have a commitment from the Office of Management and Budget to protect the rest of your aeronautics and space technology budget against offsets because of the need to divert funds to the space plane, or will you need to trim other programs in that area?

Dr. FLETCHER. We never have a commitment from OMB, I'm the only one here, Mr. Chairman. But you have my word—while, I'm here at least. We're not going to sacrifice the aeronautics budget for the aero-space plane, and we haven't so far. The aero-space plane is an important program to NASA in the sense that it provides a technology test bed, which we could get in no other way. So, it is a plus in terms of aeronautics technology, especially in the hypersonic regime, but we're not going to sacrifice the rest of the aeronautic program to fund the aero-space plane.

TRAVEL BUDGET

Senator PROXMIRE. I note that your travel budget has been sharply increasing over the last 2 years. In 1986 you spent $29.2 million for travel while your 1988 travel estimate is $43.3 million. That would be an increase of almost 50 percent over 2 years. Can you tell us why your travel budget is going up so sharply?

Dr. FLETCHER. Mr. Newman will provide the details, but let me give you a general picture of that, Mr. Chairman. Since the accident, we have become painfully aware that we have to control our larger programs, particularly the space transportation system and the space station, but also things like the space telescope, much more tightly from headquarters. This requires a lot more travel, even in the space shuttle. A lot of the work that was being done for flight readiness review, and some things of that sort have been done by telephone. That turns out to be a mistake, because you have to go down there and have a dialog and communicate with each other before each flight before you can feel that you're ready to go. So, the bulk of that increase is because we were actually traveling. We plan to travel more than we have been. Not a large amount more, but a small amount more. But the exact figures Mr. Newman can supply.

Senator PROXMIRE. A 50-percent increase in 2 years is a lot more.

Mr. NEWMAN. Well, in fiscal year 1986, after the accident, there was a reduction in travel—travel that would have been performed in connection with the missions that were terminated. So, the 1986 figure was cut back a couple of million below our original plan.

In 1987, three things are driving the estimate up primarily. One is that there was an increase in per diem rates, and that accounts for about $3.5 million of the increase.

Second is that we are doing a good deal of additional travel now to monitor the recovery activities on the shuttle.

And the third is the decision to locate the space station program office in the Washington area. That has involved moving a lot of people into the Washington area. It has involved a good deal of per diem for people who are otherwise assigned to the centers. And that's the case in fiscal 1987.

Now, in fiscal 1988 we are planning to increase the people, the civil service staffing, by 625 people. Those people are being brought on primarily in a program management mode and travel for them accounts for about $4 million. In addition, we're estimating about a 5-percent increase in the cost, and that's about $108 million for the increase in fiscal fiscal 1988.

PERMANENT HEADQUARTERS STAFF

Senator PROXMIRE. Well, last year's justification projected a permanent headquarters staff of 1,242 in fiscal year 1986. Your final total is considerably higher than that, 1,354. Can you tell us why you experienced a 9-percent increase over last year's estimate in your headquarters staff?

Dr. FLETCHER. That relates, Mr. Chairman, to the same point I made earlier. A very strong recommendation of the Rogers Commission was that we get better control of our programs from headquarters and we had increased the number of people in headquarters, particularly in the space station. We also had to increase our Inspector General's Office, our safety, reliability, and quality assurance people, which is a very hefty increase in headquarters personnel.

EST TRAINING

Senator PROXMIRE. You've asked for $3,214,000 to support personnel training in 1988, an increase of 12 percent over the current estimates. That is also a very large increase, and I'm wondering if all this money is being put to good use.

Last December The Wall Street Journal reported that NASA spent $45,000 to provide 50 engineers and managers EST, or Erhard Seminars Training. This is $900 per person for what Dr. William Gaylin of the Hastings Center, a nonprofit research group that studies ethical issues in medicine, calls, "A quick fix, simple solutions to agonizing problems which are no more than nostrums that appeal to a vulnerable population ready for magic."

My question is whether the effectiveness of this sort of training can even be studied, but can you tell us specifically how this sort of training has affected the productivity of your employees who underwent EST? In other words, do you have any scientific evidence that EST training has provided actual benefits to NASA personnel?

Dr. FLETCHER. I'm afraid we're not familiar with that report, Mr. Chairman, you caught us by surprise.

Senator PROXMIRE. Well, it sounds like a good candidate for a golden fleece award.

Dr. FLETCHER. You may be right.

Senator PROXMIRE. But I don't give it to anything that already has the publicity.

Dr. FLETCHER. Mr. Chairman, please don't give us the award until we've had a chance to read the article and respond.

Senator PROXMIRE. Now, if I may ask you, Dr. Fletcher, have you ever had EST training yourself, and, if so, did you feel it helpful?

Dr. FLETCHER. As a matter of fact, I've had such training, and I have mixed reviews. Sometimes it's traumatic and I think a better person to ask would be my wife.

Senator PROXMIRE. Well, it might ease marital problems. You say it's dramatic or traumatic?

Dr. FLETCHER. I said traumatic.

Senator PROXMIRE. I'm glad I asked for the clarification.

How many other NASA personnel have had that training and how much have you spent in total over the last 3 years on that sort of activity?

Dr. FLETCHER. I think I'll have to supply that for the record, Mr. Chairman.

[The information follows:]

EST TRAINING

NASA has not authorized any EST training in the last 3 years except as mentioned on page 85, line 16.

The amount spent over the last 3 years is as follows:

Fixed-price subcontract EER to TTI	$45,000
EER workshop-related costs	4,900
EER G&A associated costs	4,300
EER fee-associated costs	3,700
Total	57,700

Forty-seven managers and engineers attended the workshop of whom five were contractor employees.

Senator PROXMIRE. Do you have any plans to continue funding for this sort of training?

Dr. FLETCHER. I will supply that for the record, too, Mr. Chairman.

[The information follows:]

NASA has no plans to continue this sort of training.

EQUAL EMPLOYMENT OPPORTUNITY

Senator PROXMIRE. Dr. Fletcher, I'm delighted to learn the agency now provides equal employment opportunity exhibits and films for schools as well as the general public, demonstrating the key roles that women and minorities have in our space program.

Frankly, when I last chaired the subcommittee about 6 years ago or so, NASA was more or less standing still in its efforts to improve employment opportunities for women and minorities. They were virtually shut out in the upper grade levels.

Can you tell us how well women are currently represented in GS-12 and above jobs? What percentage of those jobs are held by women at NASA as compared with the percentage of women in your total workforce?

Dr. FLETCHER. Yes; Dr. Jenkins is here, and I think she would be happy to respond. And by the way, one of the smart things that I did, there may not be very many during my first term, was to bring Dr. Jenkins on board.

Senator PROXMIRE. There were many; you did a good job.

Dr. FLETCHER. And I think the EEO activities have dramatically improved since she has come aboard.

Harriett?

Mrs. JENKINS. Good morning, Chairman Proxmire. I am pleased to say that NASA has continued to make very good progress in bringing minorities and women on board into the workforce. We will supply for the record the number of GS-12 and above hired. Minorities and women now make up more than one-third, 33 percent, of the total workforce, and 17.7 percent of the scientists and engineers, 10 percent or more are managers and supervisors. So, we feel very proud of that.

Last year we hired about 1,500—excuse me, 1,500 people all together, 500 some odd scientists and engineers. The percent of minorities and women was 40 percent of those hires. So, we feel very proud of that.

Senator PROXMIRE. Is it the highest ever in NASA?

Mrs. Jenkins. No. Minorities and women range approximately from 35 to 42 percent of our professional hires at NASA.

Senator PROXMIRE. Have you compared them with other agencies?

Mrs. Jenkins. We compare very favorably, both in our hiring percent and percentage of the workforce of engineers.

Senator PROXMIRE. I'm not sure, you may have answered this question, what percentage of minorities and women are employed at the GS–12 and above level, and how does that compare with the percentage of minorities and women in your total workforce?

Mrs. Jenkins. Mr. Chairman, I said we would supply the GS–12 and above for the record. But I can also share with you that we have been closing the gap in the average grade between women and minorities and nonminority males.

Senator PROXMIRE. That's exactly what I want. I would like to have the figures for the record for 1985, 1986 and to date, 1987.

Mrs. Jenkins. We will supply that for the record.

[The information follows:]

Comparison of Number and Percent of Minorities and Females in GS-12 and Above Jobs with Their Number and Percent in the Total NASA Work Force in 1985, 1986 and to Date, 1987

	Total Work Force		G-12 and Above	
	No.	%	No.	%
9/30/85				
Non-Minority Males	14666	67.21	10797	84.20
Non-Minority Females	4273	19.58	987	7.70
Minority Males	1670	7.65	839	6.54
Minority Females	1213	5.56	200	1.56
Total Minorities & Females	7156	32.79	2026	15.80
9/30/86				
Non-Minority Males	14276	66.14	10612	82.85
Non-Minority Females	4371	20.25	1086	8.48
Minority Males	1695	7.85	872	6.81
Minority Females	1241	5.75	239	1.87
Total Minorities & Females	7307	33.86	2197	17.15
3/31/87				
Non-Minority Males	14139	65.53	10647	81.76
Non-Minority Females	4455	20.65	1203	9.24
Minority Males	1721	7.98	906	6.96
Minority Females	1262	5.85	267	2.05
Total Minorities & Females	7438	34.47	2376	18.24

The percent of minorities and females at GS-12 and above was less than half of their percent in NASA's total work force in 1985 (48%) and has increased each year to 50.6 in 1986 and 52.9 as of 3/31/87. These increases have occurred for minority males and females, as well as for non-minority females.

Comparison of Average GS/GM Grade Levels of Non-Minority Males with Minorities and Females in NASA's Science and Engineering Work Force for FYS 1985-1987

	9/30/85	9/30/86	3/31/87
Non-Minority Males	13.10	13.20	13.20
Non-Minority Females	11.22 (1.88)	11.32 (1.88)	11.42 (1.78)
Minority Males	12.20 (0.90)	12.21 (0.99)	12.30 (0.90)
Minority Females	10.93 (2.17)	11.19 (2.01)	11.30 (1.90)
Total Minorities & Females	11.66 (1.54)	11.69 (1.51)	11.79 (1.41)

The average GS/GM grades for minority and female scientists and engineers continued to increase in each of FYS 1985-1987. The gap between that group as a whole and non-minority male scientists and engineers continue to decrease slightly each year; and this was accomplished by increased average GS/GM grade level movement among minority and non-minority females. Although the gap in average grade between minority and non-minority males was not reduced, the average grade for minority male scientists and engineers did improve from 1985 to 1987; and this was particularly true for Hispanic and Black males during that time frame.

SUBCOMMITTEE RECESS

Senator PROXMIRE. Well, thank you, Dr. Fletcher, you were an excellent witness as are your colleagues who accompanied you here. You did a fine job.

The subcommittee will stand in recess until Friday, April 24 at 10 in the same room, when we will take testimony from the Federal Home Loan Bank Board, the Neighborhood Reinvestment Corporation, and the National Institute of Building Sciences.

[Whereupon, at 12:10 p.m. Friday, April 10, the subcommittee was recessed to reconvene at 10 a.m. Friday, April 24.]

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT-INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1988

FRIDAY, APRIL 24, 1987

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10:04 a.m., in room SD-124, Dirksen Senate Office Building, Hon. William Proxmire (chairman) presiding.

Present: Senator Proxmire.

FEDERAL HOME LOAN BANK BOARD

STATEMENT OF EDWIN J. GRAY, CHAIRMAN

ACCOMPANIED BY:
- LAWRENCE WHITE, BOARD MEMBER
- ROBERT SAHADI, DIRECTOR, OFFICE OF POLICY AND ECONOMIC RESEARCH
- HARRY QUILLIAN, GENERAL COUNSEL
- THURMAN C. CONNELL, DIRECTOR, FSLIC
- WILLIAM BLACK, DEPUTY DIRECTOR, FSLIC
- SHANNON FAIRBANKS, CHIEF OF STAFF
- DENNIS M. PITTMAN, BUDGET OFFICER
- S.G. FRANK HAAS III, DIRECTOR, OFFICE OF DISTRICT BANKS
- RICHARD PETROCCI, DIRECTOR OF ADMINISTRATION

OPENING REMARKS

Senator PROXMIRE. The subcommittee will come to order.

Chairman Gray, we are delighted to see you. You are an old friend of this chairman and the ranking member, Senator Garn. As you know, we have often had hearings of this kind, and we welcome you.

We will take testimony today from the Federal Home Loan Bank Board, the Neighborhood Reinvestment Corporation, and the National Institute of Building Sciences, so today's hearing will focus on three agencies that are extremely important to the housing industry.

Our first witness is Edwin J. Gray, Chairman of the Federal Home Loan Bank Board.

PREPARED STATEMENT

Before you proceed with your oral presentation, Mr. Gray, we have received a prepared statement from Senator D'Amato. The Senator from New York has an active interest in the testimony to be presented today but was unable to be present due to other commitments. Without objection, I will place his statement in the record at this point.

[The statement follows:]

STATEMENT OF SENATOR D'AMATO

Mr. Chairman, I am pleased to hear testimony addressing the fiscal year 1988 budget for the Federal Home Loan Bank Board, the Neighborhood Reinvestment Corporation, and the National Institute of Building Sciences. These organizations play vital roles in providing health and stability for the housing industry.

The thrifts and the FSLIC have experienced a great deal of difficulty in the last few years. Savings and loans have had a difficult time surviving. Many have found it impossible to stay afloat. I am hopeful that 1987 will represent a turning point from the problems of the past. I am hopeful that we can put these problems behind us, and move onward.

For fiscal year 1988, the Federal Home Loan Bank Board requested a total of $31.8 million. Of this $31.8 million, approximately $30 million is requested for administration expenses for the Bank Board and $1.6 million is requested for the administrative expenses of the Federal Savings and Loan Insurance Corporation.

In addition, the Federal Home Loan Bank Board is requesting supplemental funding for fiscal year 1987 totaling $700,000. This money is intended to fund the January 1987 general pay raise and the additional agency expense of the new Federal Employees Retirement System.

The Neighborhood Reinvestment Corporation is involved in investment to revitalize urban neighborhoods. In fiscal year 1987, the Corporation received an appropriation of $19 million. For fiscal year 1988, the administration has requested $18.7 million, a slight decrease from fiscal year 1987. As the ranking Republican of the Housing Subcommittee of the Committee on Banking, Housing, and Urban Affairs, I believe that we must place a high priority on addressing the problems of declining neighborhoods across the country.

The National Institute of Building Sciences is involved in activities affecting housing rehabilitation, foreign influences on U.S. construction, factory-building housing, land use and development, asbestos abatement in buildings, indoor air quality and radon, fire hazards, and other projects affecting housing in the United States. I am pleased to support programs which promote quality housing in this country.

Thank you, Mr. Chairman.

BUDGET REQUEST

Senator PROXMIRE. Mr. Gray, you are requesting a limitation of $31,805,000 on the Board's administrative expenses plus the administrative expenses of the Federal Savings and Loan Insurance Corporation. Of course, all of your costs are paid, through assessments against the 12 Home Loan Banks and the FSLIC for services rendered.

As you know, Mr. Gray, you seem to be presiding over a real liquidity crisis in the savings and loan industry at this time. While a majority of savings and loans are doing well, a number are in serious difficulty.

I see you have a rather lengthy statement, which will be inserted in the hearing record in its entirety. I would appreciate it if you could summarize your remarks, and confine your remarks to ten minutes, and then we will go into questions.

Mr. Gray. Thank you very much, Mr. Chairman. It is good to be back.

INTRODUCTION OF ASSOCIATES

I would first like to introduce the people at the table with me. My colleague, to my left, Lawrence White; Shannon Fairbanks, the Chief of Staff; Bill Black, Deputy Director of the FSLIC; Bob Sahadi, Director of the Office of Policy and Economic Research; and Dennis Pittman, our Budget Director; Harry Quillian, General Counsel; Frank Haas, Director of the Office of District Banks, not at the table, but back there; and Richard Petrocci, Director of the Office of Administration. That is our group.

SUMMARY STATEMENT

As you know, these are very challenging times for the Bank Board. Some of the progress we have made, as well as the challenges that we continue to confront, are outlined in some considerable detail in the statement I submitted to you on Monday.

THRIFT REGULATION

During these past 4 years of my tenure as Chairman of the agency, I have had to deal with a formidable array of problems. I recognized early on, when it was unpopular to believe, or even say, that thrift deregulation, as thrift deregulation was interpreted by many in and out of the thrift industry, was on a collision course with the safety and soundness of the FSLIC. I said it, I believed it, and I set about in the face of opposition from many in and out of government to face up to that challenge.

The sad fact is that thrift deregulation was thrust upon a regulatory apparatus that was neither designed nor equipped to deal effectively with the result. Further, many in the industry itself believed, and some still do, that thrift deregulation was intended to consign the regulator to oblivion. Some in the government also, apparently, subscribed to that notion.

At a terribly critical time, in the first several years or so of thrift deregulation, OMB repeatedly denied my request for more examination personnel. The Bank Board finally took matters into its own hands, and in the face of OMB opposition, we took the ultimate step of simply removing the examination function from OMB's jurisdiction.

If there had been a recognition, as there ought to have been, by all parties, including the Congress, that without adequate regulatory tools, and without sufficient well-trained personnel to examine and supervise enterprises operating under the government's guarantee, the scarce resources of the FSLIC would be endangered. If there had been such a recognition earlier on, we might not be facing the current problem at the FSLIC.

SALARY LEVELS

Indeed, some of the same difficulties we have faced continue. We are not treated in the same manner as our commercial banking regulatory colleagues. Bank Board/FSLIC employee salary levels are set by the

Office of Personnel Management. The average annual salary of our 192 professional staffers at the FSLIC is only $35,000. The turnover rate is running at 26 percent annually. Because we are treated differently from the FDIC and the Comptroller's Office, since their salary classifications are determined by themselves, and not by OPM, they enjoy the luxury of an upper-end salary compaction problem. I wish to God that we could have such a problem.

I have sought legislation from the beginning of my tenure to make the Bank Board a mixed government corporation so that our Bank Board/FSLIC employees would be treated in the same manner as the employees of the FDIC. Last year, we came the closest to essentially achieving our goal when the House passed the Carper-Lundine bill.

COMPARABILITY WITH FEDERAL DEPOSIT INSURANCE CORPORATION SOUGHT

In my opinion, Mr. Chairman, one of the most important things that Congress could do to help our agency would be to place us on a level playing field with the FDIC. We have a small fraction of the staff available to the FDIC, and at lower rates of compensation. Yet, the magnitude of our problem in absolute dollars is approximately the same as the FDIC's.

In our FSLIC caseload, there are $58 billion in assets spread through nearly 200 severely troubled thrift institutions, which have a negative net worth of $6.6 billion. The FSLIC staff estimates that it will cost the thrift insurance fund from $12 to $14 billion to resolve these cases alone, and it could cost more. Yet, we have only 191 professional FSLIC employees to deal with the problem, and their average yearly salary, as dictated by OPM standards, is $35,000 a year.

These are the people who are called upon to handle and resolve the most sophisticated financial problems and transactions in the history of finance. So it is no wonder that we are running a 26 percent annual attrition sale at the FSLIC. Meanwhile, the FDIC can hire as many employees as it needs, and can set their salaries independently in the interest of attracting the best people they can get.

In my opinion, the disparity which exists needs to be addressed. The Bank Board needs the flexibility that the FDIC has. The Congress can help us, and I believe the Congress should and must help us in this regard.

RECAPITALIZATION OF FEDERAL SAVINGS AND LOAN INSURANCE CORPORATION

With respect to the need to recapitalize the FSLIC, I have restated the Board's position in my formal written statement to the subcommittee. Though the Senate bill to recapitalize the fund does not include exit fees, I have sought to express my views in some detail on this matter in the statement. I would like to call your special attention to it.

Yesterday, I testified before the Energy and Commerce Subcommittee of the House, chaired by Representative John Dingell. In the statement I submitted to that subcommittee, I took some time to express my deepest possible concerns about so-called forbearance provisions contained in the House Banking Committee bill to recapitalize the FSLIC.

While the legislation does not pertain to this House, that is to say, the Senate, I nevertheless want to say that if the provisions I am concerned about were to become law, any congressional authorization to recapitalize the FSLIC would be rendered virtually meaningless.

The House provisions I have referred to in that testimony would hamstring the regulator, tie the regulatory process in knots, and perpetuate an unending hemorrhage of losses to the FSLIC, resulting in a black hole of simply huge costs for the nation's taxpayers. The consequences to the thrift system would be disastrous.

Indeed, my fellow banking regulators are concerned that the thrust of such provisions could spill over into the commercial banking regulatory sector, ultimately causing severe damage to the entire financial system in the country.

Only yesterday, the Federal Savings and Loan Advisory Council, meeting here in Washington, took a strong position against the so-called forbearance provisions in the House bill. The Advisory Council said, "The issue of forbearance is being used to divert attention from the real issue. There are real losses imbedded in a large segment of the thrift industry. Congress should act to minimize the present value of these losses now, rather than debating about forbearances and forcing a much higher price later," the Advisory Council said.

It also warned that if Congress chooses "to make FHLBB enforcement unworkable"—that is, to hamstring regulators and tie the regulatory process in knots—then "the Congress should be prepared to bear the resulting cost of its forbearance policy from the general tax base," and that is to say, the American taxpayers.

The matters are not now before this body that I am referring to, but I alert you to my concerns because they may well be very soon.

No real purpose can possibly be served by recapitalizing the thrift fund while tying the regulators' hands behind their backs, and that perpetuating future severe losses which someone will have to pay.

Thank you very much, Mr. Chairman.

[The statement follows:]

STATEMENT OF EDWIN J. GRAY

Mr. Chairman and Members of the Subcommittee:

I appreciate the opportunity to present today the fiscal year ("FY") 1988 budget request of the Federal Home Loan Bank Board (Bank Board or Board). Our total 1988 request is $31,805,000, of which $30,186,000 is requested for Bank Board administrative expenses and $1,619,000 is requested for the administrative expenses of the Federal Savings and Loan Insurance Corporation (FSLIC). We are also requesting, with the Administration's support, budget supplementals for FY 1987 totaling $700,000 for the Bank Board's administrative budget. These supplemental increases are needed to fund the January 1987 general pay raise ($350,000), and the additional agency expense of the new Federal Employees Retirement System (FERS) ($350,000) established under Public Law 99-335.

While the Congress continues to make decisions concerning the reduction of the federal budget deficit, every agency head must address the potential of a FY 1988 budget reduction related to the Gramm-Rudman-Hollings Act. I continue to have major concerns regarding the application of such reductions to our expenses financed from non-federal sources and, more importantly, the potentially serious impact of funds reductions on the FSLIC and FSLIC-support activities.

A reduction to our requested FY 1988 budget would directly impact the FSLIC's default prevention and liquidation activities. This is because our budget funds FSLIC and vital Bank Board support services such as legal, accounting, and data processing. Moreover, 69% of our administrative budget funds salaries and pay-related benefits, so that even relatively small reductions would threaten essential staffing levels.

I will describe, in detail, the condition of the FSLIC insurance fund, and landmark initiatives underway to recapitalize the fund but at this juncture, I also note the anomaly of potential budget cutbacks impairing the agency's resources while the Congress, the Administration, and the Bank Board simultaneously endeavor to recapitalize the FSLIC fund.

I. OVERVIEW - STATE OF THE THRIFT INDUSTRY, STATE OF THE FSLIC FUND, AND RECAPITALIZATION

A. State of the Thrift Industry

As the majority of thrifts recovered from the effects of the high-interest-rate environment of the early 1980s, the thrift industry fragmented into a profitable majority and an unprofitable minority. In 1986 the gap between the two groups widened.

Net after-tax income of the approximately 80 percent of FSLIC-insured institutions that were profitable totaled $9.2 billion during 1986. This income represented a 25 percent increase over the income earned by these institutions during 1985.

These institutions' aggregate annualized return on assets rose to a near-record 1.02 percent last year, up from 0.88 percent in 1985 and represented the best such return on assets since the early 1950s, when thrifts were taxed at sharply lower rates. The sources of the profits of these firms also improved last year, with more than two-thirds of before-tax income coming from recurring operating sources, compared to only one-half during 1985. By retaining most of these large profits, and through the sale of common stock and subordinated debentures, these profitable firms increased their regulatory capital from 5.04 percent of liabilities at the end of 1984, to 6.09 percent at year-end.

The unprofitable one-fifth of the industry endured financial hardship during 1986. The after-tax losses of these institutions during 1986 totaled $8.3 billion, more than double the 1985 loss of unprofitable firms, and their return on assets deteriorated to -3.80 percent, from -1.96 percent in 1985. Most of these increased losses reflected larger losses on the sale of assets and sharply larger loan write-downs. This resulted from previous poor loan underwriting, exacerbated by the severe decline in the energy and agricultural sectors of the economy, and by the reduced resources of the FSLIC fund, which made it impossible to resolve problem cases seasonably, as discussed more fully below. The poor operating experience of these unprofitable institutions turned their aggregate regulatory capital negative by year-end.

On a brighter note, FSLIC-insured thrifts as a whole made further progress in portfolio restructuring designed to reduce interest-rate risk exposure and to stabilize income. The industry raised the percentage of its mortgage loan portfolio consisting of adjustable-rate and balloon loans to 43 percent at the end of 1986 from 41 percent a year earlier. It also reduced its ratio of cumulative one-year hedged maturity gap to total assets from -25 percent to -18 percent over the same period. But, in contrast to this progress, the industry's ratio of repossessed assets and slow loans to total assets rose from 3.12 percent at December 31, 1985, to 4.45 percent at the end of December 31, 1986. Liabilities of FSLIC-insured thrifts grew by about 9 percent in 1986, slightly faster than the 8 percent pace of a year earlier, but well below the unsustainable 17 percent pace of 1983 and 19 percent pace of 1984.

During 1986, thrifts further enhanced their position as the nation's primary housing lenders. Despite the relatively moderate pace of liability growth, FSLIC-insured institutions made a record $265 billion of mortgage loans, 35 percent more than in 1985, due largely to a sharp increase in refinancings as mortgage rates declined, combined with a rise in loan sales in the secondary mortgage market.

Indeed, at the end of 1986, thrift institutions held in their portfolios around 45 percent of the residential mortgage debt in the country.

Nearly one-third of the nation's mortgage-backed securities were not held by private investors, pension funds, insurance companies, etc., but yes by thrifts, to the tune of $158 billion at the end of 1986. During 1986, insured thrift institutions originated two-fifths of the home mortgages in the country, compared to one-fifth by commercial banks.

B. State of the FSLIC Fund

By law, the FSLIC must maintain its financial records on an accrual basis, adhere to Generally Accepted Accounting Principles ("GAAP"), and have its financial records audited by the General Accounting Office ("GAO"), an arm of the Congress. One of the FSLIC's liabilities, the Estimated Contingent Liability Account, as required under GAAP, was increased by several billions of dollars as of December 31, 1986. The GAO has advised us that it believes that our increase in the Estimated Contingent Liability Account is consistent with GAAP. This increase in the Estimated Contingent Liability Account substantially reduced the FSLIC's total reserves, and, therefore, the FSLIC fund was insolvent at the close of 1986.

The Bank Board, in 1986, continued to exercise its full statutory authority to obtain receipts for the insurance fund. For the second consecutive year it used this authority to impose a "special assessment" premium of 1/8 of one percent of the deposits of FSLIC-insured institutions, and raised $1.1 billion through four quarterly assessments of 1/32 of one percent each. In addition, it raised nearly $750 million through the regular FSLIC premium of 1/12 of one percent of deposits. Even so, and independent of the increase in the Estimated Contingent Liability Account as discussed in the preceding paragraph, the reserves of the fund declined last year, as case resolution costs and expenses exceeded premium and investment income for the second year in a row.

The FSLIC fund's liquid assets, consisting of cash and investment securities, today total less than one billion dollars. This reflects a reduction of the FSLIC fund's liquid assets that occurred when, on March 17, 1987, the FSLIC made payment in the sum of $1.069 billion to the Federal Home Loan Bank ("FHLBank" or "Bank") of Dallas to honor its guarantee agreements with that Bank. Under these agreements, the FSLIC guaranteed the payment of secured and unsecured loans made by that FHLBank to troubled institutions. Such loans are typically necessary to enable the institutions to meet their liquidity shortages, primarily prompted by insured deposit withdrawals. The independent accountants for the Dallas Bank had indicated that they might render a qualified opinion concerning the Bank's financial condition, absent the repayment of these unsecured loans to troubled institutions, because they questioned the value of the FSLIC guaranty in light of the FSLIC's insolvency.

In light of the foregoing, each of the FHLBanks has indicated a reluctance to make advances to troubled institutions unless the advances are both secured by collateral pledged by the institutions and guaranteed by the FSLIC. Because many of the institutions lack sufficient assets to pledge as collateral, they generally will be precluded from borrowing adequate funds from the FHLBanks to satisfy their liquidity requirements. Now, the FSLIC will have to develop other methods to assist troubled institutions in covering their liquidity shortages. These cash demands could be met by the FSLIC directly lending to troubled institutions, but this would quickly drain the FSLIC's limited liquid assets. Troubled institutions also could raise funds by increasing the interest rates on deposit accounts to encourage deposit renewals, thereby raising rates for all depository institutions, and increasing the operating losses of the troubled institutions. Both alternatives are unattractive.

The payment to the FHLBank of Dallas depleted the FSLIC's available cash, thereby precluding the FSLIC from using the cash to close some troubled institutions. Perhaps most significantly, this payment represents a small example of what would happen if there were a loss of public confidence in the FSLIC.

C. Recapitalization - the Bank Board Legislative Agenda

1. Background

As noted above, the FSLIC is insolvent under GAAP and it lacks the financial resources to cost-effectively resolve its caseload of insolvent institutions. Last year, the Bank Board and the Treasury Department recognized that it was critical for legislation to be adopted that would recapitalize the FSLIC. We determined that it would be in the best interests of the American public and the thrift industry for such a recapitalization program to provide the FSLIC with sufficient funds without resorting to the use of taxpayer dollars or increasing the Federal budget deficit. After consultation with representatives of the FHLBanks, we developed a recapitalization program that would accomplish these objectives by establishing a corporation, the Financing Corporation, that would contribute capital to the FSLIC with funds it obtained from the issuance of bonds.

During the second session of the 99th Congress, both houses of the Congress, in recognition of the importance of recapitalizing the FSLIC, introduced bills that would have established a Financing Corporation that could have raised up to $15 billion in the capital markets over a five-year period. The $15 billion capital contribution, when added to the FSLIC's anticipated revenues (from insurance premiums and other sources), would have provided the FSLIC with from $25 to $32.5 billion over the next five to seven years. Unfortunately, although both the House and the Senate had approved their respective versions of the bill, final legislation was not enacted during the 99th Congress.

At the very beginning of the first session of this 100th Congress, the leaders of the House and Senate Banking Committees introduced bills to recapitalize the FSLIC -- H.R. 27 and S. 45. These bills as originally introduced were nearly identical to the bills introduced during the 99th Congress. They would have created a Financing Corporation that could have provided the FSLIC with up to $15 billion in additional capital.

I regret to report that, at this time, the recapitalization bills have been amended so that they fail to resolve effectively the FSLIC's financial crisis. Neither the bill passed by the Senate (S. 790), nor the House Banking Committee's current proposal, provides the FSLIC with the necessary funds or with the expanded "exit fee" authority sought to ensure the viability of the recapitalization program. The Senate bill authorizes a capital infusion of only $7.5 billion, and the current House Banking Committee proposal authorizes a capital infusion of only $5 billion. Neither bill provides even enough additional funds to deal with the FSLIC's insolvency, as of the end of 1986.

As discussed below, an integral part of the Bank Board's recapitalization program is the expansion of the FSLIC's existing statutory authority to levy "exit fees" on healthy institutions that voluntarily switch to FDIC insurance during the initial years of recapitalization. Currently, we have express statutory authority to levy an "exit fee" in an amount equivalent to the sum of (i) twice the previous year's regular annual FSLIC premiums paid by the institution and (ii) twice the previous year's special premium assessment paid by the institution. During this period of crisis, it is our view that such an amount is inadequate and unfair, as it permits healthy institutions to escape future payment of necessary special assessments, which are intended to permit the FSLIC to recover for past undercharging for its insurance given the level of risk it insured.

Despite our urgings, neither the Senate bill nor the House Banking Committee proposal provides the FSLIC with the expanded "exit fee" authority we seek. The Senate bill fails to address "exit fees" at all. The current House Banking Committee proposal appears to at best maintain the FSLIC's authority at the above-described "two-plus-two" level, and it would actually require the FSLIC to rebate some of the "exit fees" it collected.

The "two-plus-two" formula was established by the Congress at a time when the FSLIC fund was in robust shape and there were no bonds that had to be repaid. Under our recapitalization plan the Financing Corporation will issue bonds with 30-year maturities. This fact and the insolvent state of the FSLIC fund clearly requires an expansion of FSLIC's existing express authority for "two-plus-two" "exit fees".

The Bank Board's Office of Policy and Economic Research has conducted computer projections to see what would happen to a $15 billion recapitalization plan if FSLIC-insured institutions with only 15 percent of all FSLIC-insured institution assets were to leave the FSLIC system over the next three years. The OPER projections show that the Financing Corporation would default on its payment to bondholders in 1995.

It has been argued that only 10% of FSLIC-insured institutions could switch to FDIC insurance in light of the FDIC's stringent capital requirements. Far more than 10% of FSLIC-insured institutions (whether measured by number or asset size) can leave the FSLIC system. In fact, 952 institutions, with 12.99 percent of the assets of all FSLIC-insured institutions, could now qualify for FDIC insurance, as shown in Appendix A. If the FDIC were to allow institutions to treat their specific loss reserves as general loss reserves, institutions with approximately 16 percent of all assets at FSLIC-insured institutions could qualify for FDIC insurance.

Moreover, there is a large group of institutions that is very close to meeting the FDIC's standards for insurance. These institutions could leave the FSLIC system by three means: continued profitability that boosted their capital, a fairly small addition of capital through stock issuance, or acquisition by an FDIC-insured institution. A FSLIC-insured institution with more than 5 percent capital (as measured by FDIC) would be a far more desirable acquisition target to a commercial bank than would a sick thrift. The assets in FSLIC-insured institutions with capital between 5 and 6 percent (as measured by FDIC) represent over 7 percent of the total assets of all FSLIC-insured institutions. Therefore, our computer runs, which evaluate a 15 percent assets loss through conversion to FDIC charters, are far from worst-case scenarios. Prospective bond purchasers may fear that even more than 15 percent of all FSLIC-insured institutions may leave the FSLIC-premium-paying system. Therefore, it is essential that the FSLIC be allowed to use exit fees that will prevent a bond default even if a substantial amount of institutions leave the FSLIC system.

Without expanded "exit fee" authority, the only way to prevent a default on the Financing Corporation's obligations would be to reinstate the special premium assessment. Continuing the special assessment, however, would be self-defeating, because it would increase the incentive of the remaining FSLIC-insured to join the FDIC. Indeed, it would spark a "race to leave" mentality. In fact, at the end of March of this year, two of the ten largest FSLIC-insured institutions submitted their formal written notices that they intended to terminate their FSLIC insurance. We believe that those notices are indications of that mentality. The suggestion that the existing express authority to require a "two-plus-two" exit fee must not be increased lest new capital be discouraged from entering the FSLIC system is erroneous. Precisely the opposite is true. No one will want to put new capital at risk in a system where those who flee first do the best and those who stay bear additional burdens because of the flight.

It also has been argued that any "exit fee" beyond the "two-plus-two" amount would be an excessive burden on institutions leaving the FSLIC system. Those who make that argument look to the information set forth in Appendix B, which suggests that the "two-plus-two" formula would require the typical institution to pay an exit fee greater than its entire annual profits. We believe that the information in Appendix C provides the relevant comparison. It shows that the institutions with sufficient capital to meet the FDIC's 6 percent capital requirements (which are, of course, the institutions most likely to leave the FSLIC first) have an average return on assets over three times greater than the industry average relied on by proponents of the "two-plus-two" formula. Even those FSLIC-insured institutions with FDIC-qualifying capital between 4 and 6 percent have a return on assets over twice the industry average. Instead of the "two-plus-two" formula requiring an exit fee in excess of annual income, for those institutions most likely to leave the FSLIC system, the "two-plus-two" formula would represent less than half of one year's after tax profits. Even a "four-plus-four" formula would only represent less than one year's after tax profits — a burden less than that apparently considered appropriate by those who want to limit us to the "two-plus-two" formula. In sum, the institutions likely to leave the FSLIC system can readily afford to pay well beyond the "two-plus-two" formula without experiencing any undue burden. Moreover, any "burden" to those leaving the FSLIC system does not disappear -- it instead falls on the rest of the industry -- the less profitable portion of the industry, which is least able to bear such a burden.

The Bank Board believes that a "six-plus-six" formula is fairest and most prudent. This formula ensures a successful recapitalization plan even if 15 percent of all FSLIC-insured institutions switch to FDIC insurance. The Bank Board understands, however, that it may be necessary to settle for a lower exit fee formula. Our analyses indicate that the Financing Corporation would be able to pay interest on its bonds even if the Congress were to authorize only a "four-plus-four" exit fee and as many as 15 percent of FSLIC-insured institutions were to leave the FSLIC system. In this situation, however, it is likely that investors would require the bonds to pay a higher rate of interest.

2. Structure of the Bank Board/Treasury Proposal

Let me take this opportunity to inform you about the structure of the FSLIC recapitalization program developed by the Bank Board and the Treasury Department. The crux of the plan is to use the retained earnings of the FHLBanks to serve as seed money for the Financing Corporation, which would leverage this seed money to borrow from $10 to $15 billion over the next few years, and to use these funds to purchase stock in the FSLIC. This would enable FSLIC to obtain capital of $25 to $32.5 billion over the next five to seven years from the sale of stock to the Financing Corporation, premium collections, and income from disposition of assets under receivership and its investments.

During those five to seven years, the FHLBanks would contribute to the Financing Corporation as much as $3 billion of their retained earnings. These earnings aggregated about $2.3 billion at year-end and, even assuming slow economic growth, are expected to grow to approximately $3 billion over the relevant period.

The Financing Corporation would function as both a funding corporation and a trust, and would have the same attributes as a government agency operating in the capital markets. Thus, it could issue safe, high-quality securities eligible for purchase by various trusts and fiduciaries. Its debt, however, would have no guarantee from the Treasury or the FSLIC. It would have no paid staff of its own, but would utilize personnel of the FHLBank System. It would sunset by the end of 2027.

The Financing Corporation's borrowings would take the form of collateralized long-term bonds. It would sell these bonds on a schedule geared to the FSLIC's cash requirements for resolving thrift insolvencies. For example, if the FSLIC's resolution costs over the next five to seven years were less than the amount we now project, the Financing Corporation would simply use less of the FHLBank's retained earnings as seed money for borrowing in the capital markets. This flexibility permits the plan to deal with resolution costs as necessary.

Payment of principal and interest on bonds issued by the Financing Corporation would be the obligation of that corporation only; no payment would be guaranteed by the U.S. Government. However, payment of principal would be assured by full collateralization at maturity by Government securities held in trust for that purpose. The Financing Corporation would purchase this collateral with a portion of the funds received from the FHLBanks. Over the 25-to-30-year term of the bonds, enough interest would compound on this collateral to assure payment of the principal amount of the bonds issued by the Financing Corporation. Sufficient investment returns for this purpose are most easily assured by purchase of zero coupon bonds, but other means are also available.

Investors could expect prompt payment of interest on bonds of the Financing Corporation because interest could be paid from two sources: (1) a reserve established with a portion of the funds contributed by the FHLBanks and (2) assessments on insured institutions by the Financing Corporation. In fact, at a recent briefing of the Committee on Banking, Financing and Urban Affairs, three leading representatives of the investment banking community stated that this Treasury Department/Bank Board recapitalization plan would provide a high degree of investor confidence in receiving full and timely interest payments on the Financing Corporation's bonds. The market would demand a premium if there were less certainty of interest payments. On the other hand, to prevent unduly burdening insured institutions, the proposal reduces the amount of premium assessments that may be imposed by the FSLIC by the amount of the assessments collected by the Financing Corporation.

In addition, the economic viability of the recapitalization would be assured, because there would be a temporary expansion of the existing express statutory authority to levy "exit fees" on healthy institutions that voluntarily drop FSLIC insurance in favor of FDIC insurance. The "exit fee" monies would be held by the Financing Corporation and would be used to ensure payment of the interest due on its bonds.

3. Benefits of the Bank Board/Treasury Proposal

This plan has several important benefits. First, the FSLIC would be able to employ as much as $25 billion to $32.5 billion over five to seven years to resolve its caseload of terminally-ill thrifts. This would halt expansion of the FSLIC's problems and boost depositor confidence in the FSLIC, the thrift system, and the overall financial system. Meanwhile, the Board continues to believe that it is vital to avoid liquidating receivership assets on a "fire sale" basis that could further reduce property values in financially distressed regions. Second, taxpayers would not spend a penny for the cost of recapitalization; the cost would be borne solely by the FHLBanks and FSLIC-insured thrifts. There would be no government guaranty of Financing Corporation debt. Third, the plan would substantially reduce the costs borne by the industry. It would allow the FSLIC to phase out its existing special assessment over the next five years -- cutting the overall premium rate by sixty percent. Fourth, the flexibility built into the plan permits the Board to raise a range of funds for the FSLIC, as needed. Fifth, the proposal is structured to create budgetary receipts from equity investments in the FSLIC that will offset budgetary outlays resulting from the FSLIC's case resolution costs.

The renewed public confidence generated by recapitalization, plus the sale, merger, or liquidation of the weakest thrifts, should help lower the thrift industry's cost of funds. This should substantially benefit thrifts, because thrift institutions currently pay 45 basis points more for their funds than they would at commercial bank rates, an amount exceeding $4 billion a year. This has been verified by studies both internally and at the Federal Reserve Board.

Studies performed by the Board's Office of Policy and Economic Research ("OPER") indicate that the passage of the FSLIC Recapitalization Plan will initially reduce this thrift/bank differential by 10 basis points or $1 billion per year. The remaining 35 basis point differential should narrow significantly over the following three to five years. This will result not only from increased public confidence, but the removal from the market of the many insolvent firms that must raise high cost deposits to remain in the current "warehoused state." Also, there will be an increased likelihood that our FHLBanks will fund some of these liability needs as the FSLIC guarantee on advances will by then be financially sound.

Additionally, the structure of the plan will protect the financial strength of the FHLBanks. The FHLBanks, whose stock is wholly owned by member savings institutions, derive their income from advances and other services provided to their members. In 1986, they earned $1.4 billion and paid out over $0.9 billion in cash and stock dividends. At December 31, 1986, the FHLBank

System had an aggregate of $131 billion in assets and $11.7 billion in capital, including retained earnings of $2.3 billion, making it one of the strongest financial entities in the world.

As I noted earlier, given their level of retained earnings and income, we expect that the FHLBanks could provide $3 billion to the Financing Corporation over the next several years. This earned surplus and the FHLBanks' extremely strong capital base insure that FHLBank debt would be protected from possible higher borrowing costs.

Again, the recapitalization plan will benefit the thrift industry by permitting the FSLIC to phase-down its special premium assessment. Under our current assumptions, the special assessment could be phased down gradually over five years. We believe this projected phase-down would provide the many healthy thrifts an important advantage if the Bank Board's and the Administration's recapitalization plan were adopted. The Board believes that this plan represents the most feasible and cost-effective method of assuring the continued strength of both the FSLIC and the thrift industry.

II. FSLIC RESTRUCTURING

The Bank Board believes that the FSLIC's funds should be used efficiently, and we are working to improve the FSLIC's ability to use such funds as they become available. Last year we initiated an in-depth review of our FSLIC case resolution and receivership operations. Based on the findings of that review, I appointed a task force to devise implementing plans and procedures for consideration by the Bank Board concerning:

-- Utilization of Federal Home Loan Bank personnel in processing FSLIC cases;

-- Strengthening the Board oversight and quality control of FSLIC receiverships and making the best high quality use of the Federal Asset Disposition Association (FADA) for both FSLIC asset analysis and the management and disposition of receivership assets;

-- Restructuring the FSLIC's case resolution process, to provide more timely due diligence reports, to facilitate earlier decision-making by the Board, and to design an improved national marketing program;

-- Legal staffing increases needed at the FHLBanks to provide legal support for local FHLBank case resolution staff work;

-- The creation of new case planning, cash management, and audit review procedures for the FSLIC. Under a current proposal, evaluation of FSLIC staff performance and bids for acquisition of institutions would be judged under a completely revised system that capitalizes the holding cost of assets in determining the benchmarks for adequate recovery of value; and

-- Implementation procedures for a new management information system — including regular and exception reporting -- to support increased involvement of the FHLBanks in FSLIC functions. This recommendation will require development of standardized FSLIC procedures for the bid valuation process, due diligence reports, case analysis, bid package preparation, and post-examination reviews.

The task force has completed its study and has presented its recommendations to the Board. The Board is currently reviewing these recommendations and has not yet reached a conclusion concerning the proposals.

III. FSLIC CASE ACTIVITY

During calendar year 1986, the Bank Board authorized the FSLIC to exercise its authority under section 406 of the National Housing Act with respect to 89 FSLIC-insured institutions that were in default.

The 89 formal actions undertaken during 1986 include 40 instances where the FSLIC took definitive action for the protection of the depositors and 49 instances where it had not yet definitively resolved all issues. Of the 49 institutions with respect to which the FSLIC undertook partial case resolution, 11 were placed in liquidating receiverships involving the asset-backed transfer ("ABT") of insured deposits to 6 federal de novo management consignment program ("MCP") associations and 23 were involuntarily placed in the management consignment program by other processes; the boards of directors of the remaining 15 institutions voluntarily agreed to the replacement of management personnel by individuals chosen by the FSLIC ("voluntary management replacement cases").

The 89 institutions that were the subject of formal FSLIC action had assets aggregating $38.8 billion, and the cost to the FSLIC of taking action with respect to these institutions totaled approximately $4.0 billion.

At December 31, 1986, there were 182 financially distressed FSLIC-insured institutions that the FSLIC staff had categorized as "FSLIC cases." An institution is categorized as a FSLIC case where (i) the FSLIC staff believes it has negative tangible net worth on a current basis and (ii) it is likely that the FSLIC will be required to use its reserves for the protection of the institution's depositors; this category includes partially resolved FSLIC cases (for example, MCP institutions) as well as unresolved FSLIC cases. The FSLIC's field staff has taken various forms of action with respect to the unresolved FSLIC cases, but, as of December 31, 1986, the FSLIC had not exercised its section 406 powers with respect to those institutions.

The above information is further explained in the table below:

Action	Cases	Assets ($Million)
A. 1986 Formal FSLIC Case Actions		
1. Partially Resolved Cases		
Liquidating Receiverships with transfers of accounts to six ABT de novo MCP's	11	$ 5,356
Other Involuntary MCP Institutions	23	$ 6,615
Voluntary Management Replacement Cases	15	$ 7,935
Total	49	$19,906
2. Completely Resolved Cases		
Sales:		
Assisted Mergers	25	$7,195
Assisted Acquisitions	2	181
Subtotal	27	$7,376
Liquidations:		
Transfers of Accounts to an Acquiror	8	$557
Cash payouts to Depositors	2	136
Subtotal	10	$693

Completion of Cases Commenced Before 1986:	Cases	Assets ($ in Millions)
Phoenix recapitalizations	2	$10,496
Sale of ABT De Novo MCP's	1	309
Subtotal	3	$10,805
TOTAL	40	$18,874

SUMMARY

1. Partially Resolved Cases	49	$19,906
2. Completely Resolved Cases	40	$18,874

GRAND TOTAL	89	$38,780
	====	=======
As of December 31, 1986		
Total (including unresolved and partially resolved) FSLIC Cases	182	$58,172
Total MCP Cases (A subset of unresolved FSLIC cases)	45	$20,190

IV. MANAGEMENT CONSIGNMENT PROGRAM

The Management Consignment Program started in April, 1985, and contained forty-five (45) active MCP cases as of December 31, 1986. The program has been a useful tool to contain problem growth in troubled institutions, and to provide the necessary time for proper evaluation of an institution's market value prior to final resolution of the case. The program provides a controlled environment for handling the case while awaiting commitment of FSLIC financial and personnel resources to a satisfactory final resolution of the case. The program, however, because the FSLIC lacks the funds to resolve these cases, has become a tool of necessity. It defers cash payouts by the FSLIC. Day-to-day supervision is delegated to the Principal Supervisory Agent in the relevant Federal Home Loan Bank District.

V. FEDERAL ASSET DISPOSITION ASSOCIATION

In an effort to minimize the FSLIC's loss on bad assets acquired from troubled savings institutions, the Bank Board in November 1985 chartered a new federal savings and loan association, under the provisions of section 406 of the National Housing Act, called the Federal Asset Disposition Association ("FADA"). The new association, governed by a 14-person board of directors consisting largely of highly successful thrift industry leaders from around the country, commenced full operations in mid-1986. All of its stock is owned by the FSLIC, which capitalized it in March 1986 with $25 million. The FADA has a ten year charter.

The FADA's mission is to assist the Bank Board and the FSLIC in the management, workout, and sale of troubled real estate assets. The FADA does not take title to any troubled real estate, but rather acts as a manager and professional real estate consultant to the FSLIC.

As of February 28, 1987, the FADA was managing more than 1000 assets with a book value in excess of $2 billion for eighteen thrifts that failed. (If 100% of the book value of all participation loans is included, the value of assets under FADA management was in excess of $3 billion.) In addition, the FADA is performing asset advisory work for troubled financial institutions, including several institutions in the Management Consignment Program that involves in excess of one billion dollars in assets.

Simply put, the FADA has become a major FSLIC contractor for asset management. The FADA has dramatically improved the FSLIC's ability to secure the highest value on loan workouts and asset sales, and to minimize the associated management expense in the interim.

The FADA will be able to achieve these goals in part by applying the expertise of its specialists to specific asset management problems, and by operating with the greater flexibility of a private organization. Moreover, the FADA's assumption of responsibility for asset management and disposition will leave the FSLIC staff free to concentrate on forming receiverships, processing claims, supervising litigation, and formulating policy.

VI. EXAMINATION AND SUPERVISION ACTIVITIES

A. Improvements in the examination and supervisory process and transfer of functions to the Federal Home Loan Banks (FHLBanks).

The severe financial crisis that has plagued the thrift industry over the past several years took its toll on the Board's capacity to examine and supervise the institutions under its jurisdiction. During this time, we frequently had to use our limited resources to handle only critical situations, rather than to engage in systematic examination and supervision aimed at preserving the health of FSLIC-insured institutions. This situation, if allowed to continue, could have destroyed our ability to protect the safety and soundness of the thrift industry. Therefore, the Board has taken positive and aggressive action to strengthen its examination and supervisory efforts.

The FHLBank System (consisting of 12 regional Banks throughout the country) is, and has been for many years, a highly decentralized one. It is truly a national system of far-flung component parts, with supervisory line functions carried out by supervisory agents in every district.

To realize fully the benefit of the FHLBank System's regional structure, the Board, as of July 6, 1985, transferred its field examination function to the FHLBanks. This historic move enabled us to pursue the process of building a well trained, effective, and efficient field examination force. By December 31, 1985, the number of professional examiners on the staffs of the FHLBanks grew from 747 to 1,003, an increase of 34.3 percent. As I stated in my testimony last year, the Board established a goal of at least 1,500 examiners for the FHLBanks by the end of 1986. I am pleased to report that there were 1,524 professional examiners on board as of December 31, 1986. This brings the total increase to 777, an increase of 104.0 percent over the staffing levels as of the date the functions were transferred. Of this increase, 376 examiners (48.4 percent), were in the Atlanta, Dallas, and San

Francisco districts, where many of the most serious industry problems exist. The flexibility afforded by the transfer of the examination function to the FHLBanks also has resulted in hiring a substantial number of additional examiners from among far better qualified candidates than was previously possible. Many new examiners have advanced degrees in business or finance and/or have professional designations, such as Certified Public Accountant.

These Board initiatives under my direction have resulted in a doubling of our professional field examination staff in just a year and a half, and a tripling of our professional supervisory staff since 1984. The professional supervisory staffing levels were increased by 62.2 percent to 550 nationwide during calendar year 1986. Training of both examination and supervisory personnel was conducted at an all-time high level during 1986. I am pleased with the progress we have achieved. However, more needs to be done and will be done, to add to the quality of our examination and supervision efforts in the FHLBanks.

B. Creation of the Office of Regulatory Policy, Oversight, and Supervision

The Office of Examinations and Supervision (OES) has always had a pivotal role in the Board's examination and supervision of insured institutions. This office has been responsible for recommending and implementing Board policy on application and case processing, monitoring and system maintenance, and review of actions taken under delegated authority by agents or employees of the Board or the FSLIC. During the past several years, numerous factors, including deregulation and the declining financial health of the thrift industry, prompted the need for an enhanced examination and supervision function.

In the wake of the transfer of the field examination functions from the OES to the FHLBanks, the Board decided to reevaluate the role of the OES. A task force, chaired by former Board Member Donald I. Hovde and including representatives of the Board and the FHLBanks, was established to conduct this study. On March 12, 1986, the Task Force recommended that the Board transfer the remaining functions of OES from the Board to a position within the FHLBank System.

After careful consideration of the recommendations of the Task Force and staff, the Board determined that its purpose of improving the effectiveness of its examination and supervisory functions would be best served by establishing within the FHLBank System a new Office of Regulatory Policy, Oversight, and Supervision (ORPOS) through which to exercise its statutory responsibility to oversee, control, and, where necessary, improve those functions. On July 24, 1986, the Board voted to establish ORPOS, and this was done effective September 27, 1986. Establishing ORPOS followed as a natural conclusion to the transfer of the examination staff to the FHLBanks. Basic to this determination was the Board's finding that such restructuring would give it the managerial flexibility it urgently needed to respond more successfully to the complex challenges posed by thrift industry conditions. To take advantage of the economies and efficiencies of combined operations, ORPOS shares, to the maximum extent practicable, accounting, budgeting, payroll, and other administrative services with the FHLBank's Office of Finance. ORPOS is charged with aiding, directing, and overseeing the actions of the Principal Supervisory Agents (PSAs) of the FHLBanks and their staffs in their supervisory roles. It assists in the processes of examination and supervision and advises as to any necessary or appropriate improvement or standardization. ORPOS advises and assists the PSAs and Board with respect to matters of policy, legislation, or regulation relating to its functions as the Board requests. Moreover, ORPOS performs for the Board any monitoring, evaluation, post-examination review, processing of applications, or other functions deemed necessary or appropriate by the Board to ensure the integrity and efficiency of the examination and supervisory functions. In addition, the new office succeeds to any delegation of authority by the Board to the former OES or its Director or employees, and performs any duties arising from such delegation and succession.

To assure that ORPOS effectively fulfills its mandated oversight responsibilities at the direction of the Bank Board, the Director of ORPOS reports solely to the Board. Although the operation is funded through assessments levied upon the FHLBanks, the budget, assessments, and other matters are decided by the Board, which votes formally on the most important of these issues.

ORPOS will establish a system for reviewing supervisory operations of the FHLBanks. It is anticipated that such reviews will be conducted for each FHLBank at least every two years. The findings of the review teams will be analyzed by ORPOS, which will then prepare summary and exception reports for the Board. The review team leaders will conduct follow-up reviews to assure that the FHLBanks are taking appropriate corrective actions on problems noted.

The reviews will serve to identify problems in the examination and supervisory function of each FHLBank. In addition, the FHLBanks will submit monthly reports of results on examination cycles, including the frequency, timeliness, and appropriateness of regular examinations; length of time spent examining institutions; number and type of special examinations, and timeliness of supervisory actions. The review will also focus on compliance with laws and regulations enforced by the supervisory agents, including the regulatory capital growth, and direct investment regulations.

C. Computer-Assisted Examination and Supervision Process

Early in 1987, the Board implemented a major advance in its examination and supervision process through greatly expanded use of computer technology. This innovative action places the Board at the forefront of financial regulatory agencies in using advanced computer technology in its examination and supervision of institutions under its purview. This project constituted a major investment by the Bank Board and the Federal Home Loan Bank System in computer hardware, software, and staff resources to achieve a major enhancement of the examination and supervision functions, as well as integration of these two functions.

The changes included introduction of three new systems. The Report of Examination System is designed to capture reports of examination on-line for later retrieval and analysis. Examination teams in the field are now provided with personal computers in order to conduct an examination. An electronic pre-formatted blank report of examination is provided to each examination team on the personal computer for use in preparing the report. When completed, the report information is telephonically transmitted to the Board's computer in Washington.

The Examination Data System captures on-line supplemental information developed during an examination which has been previously retained in workpapers. This information is also recorded on the personal computer at the examination site, and is subsequently forwarded electronically to the appropriate FHLBank and to Washington for later retrieval and analysis. The Supervisory Action Control System captures data regarding the issues or problems facing insured institutions and the supervisory postures taken in response to them by a FHLBank.

Implementation of these systems entailed a major commitment of time, money, and personnel in the Federal Home Loan Bank System and the Bank Board. As a result, however, the Federal Home Loan Bank System has achieved historic enhancements in its examination and supervision processes, the first of which was development of a standardized format for the Report of Examination. As part of the Report of Examination System, there is maintained on the Bank Board's mainframe computer a current version of the Report of Examination format. A copy of this format is transferred to the on-site examiner for his or her use in preparing the report of examination. The Bank Board believes that use of a consistent and uniform report format will make the examination report, as the principal product of the examination process, a more useful and effective tool in the Board's regulatory function. All readers of the report throughout the Bank Board and the Bank System will know the prearranged location in the report format where major comments and other features will appear.

A second major outcome of these changes is to accelerate and to broaden the availability of the examination report. The Board believes that the report findings will be more meaningful and have greater effect if made available more immediately and widely to those within the agency with a need for access to the document.

A final major outcome of these changes is to increase the quality of information available on-line through the system to analysts. This includes examination information previously retained in workpaper files and key information on supervisory actions.

VII. ENFORCEMENT

The Office of Enforcement was created in late 1985 by the transfer of personnel and responsibilities from a division within the Office of General Counsel to an independent office. It is responsible for coordinating the Bank Board's formal enforcement activities to ensure proper and efficient application of the Bank Board's enforcement authority. The separate Office of Enforcement was created to increase the number of enforcement personnel to keep pace with the increase in supervisory staff at the FHLBanks, to expand the independence and effectiveness of enforcement personnel, and to enable the staff to address better and more quickly the referrals for formal enforcement action against violations of laws and regulations and unsafe or unsound practices in the thrift industry. These goals have been substantially attained.

The Office, with its increased staff, can address emergency situations quickly, including challenges to the Bank Board's enforcement authority in federal court. Although the Office prosecutes enforcement cases in administrative litigation as needed, the great majority of its cases are resolved by obtaining consent agreements. The Office works closely with supervisory personnel in the FHLBanks to address their concerns within the confines of the Board's enforcement authority. As I noted last year, from 1984 through early 1986 the Bank Board issued a number of directives to supervisory staff at the FHLBanks prescribing firm corrective action in response to all material violations and highlighting particular areas of concern. As a result of these directives, the number of FHLBank referrals to and communications with the Office of Enforcement have increased. The Office also sends advisory bulletins to the supervisory staff at the FHLBanks on important enforcement matters. The FHLBank staff increasingly seek the advice and assistance of the Office of Enforcement when informal supervisory efforts are inadequate to address problems in the industry. The increase in staff has also enabled the Office to respond swiftly to alleged violations of securities laws and alleged illegal acquisitions of control of thrift institutions.

During calendar year 1986, the Office of Enforcement obtained 58 cease-and-desist orders and 48 removal and prohibition orders, and completed 15 securities cases. This represents a substantial increase over the number of actions during 1985. The heightened responsiveness and capability of the Office better enable the Bank Board to halt violations and unsound practices and prevent or reduce dissipation of assets at insured institutions, thereby aiding preservation of the FSLIC insurance fund.

VIII. BOARD COMPENSATION AND BENEFITS

Last year I presented detailed testimony concerning the recruitment and retention problems of the Bank Board in competing with the private sector and other financial regulatory agencies. Despite narrowing the compensation and benefits gap between our agency and the Federal Reserve Board (FRB), the Federal Deposit Insurance Corporation (FDIC), and the Office of the Comptroller of the Currency (OCC), the Bank Board still lacks the flexibility of those financial regulatory agencies to offer more desirable basic employment packages.

We at the Bank Board are, however, quite proud of our progress towards compensation parity with such other financial regulatory agencies. The establishment of ORPOS provided nearly seventy former Board employees a competitive compensation and benefits program. As I noted earlier, talented individuals thereby attracted to and retained by ORPOS are already yielding dividends to the examination and supervision function still under the Board's authority.

During the past year the Board has initiated, for the first time, its own health benefits plan, providing comprehensive medical, dental, and vision care. Through this plan our employees may obtain health benefits at costs significantly below those of other Federal health benefits programs. The Board is interested in fashioning an analogous life insurance plan for our employees.

In addition to Board initiatives, I am pleased that all Federal employees received a 3% general salary increase after several years with little or no cost-of-living increases. Our Senior Executive Employees also received an additional 3% increase following Congressional action on pay raises for Executive level employees. The new Federal Employees' Retirement System offers Federal employees an enhanced pension plan, including a private-sector-like thrift savings component, coupled with matching government funds. Another plan designed to reduce the gap between federal and private sector compensation is the President's proposal to reform the Federal pay and classification system.

Although we are pleased with the enhanced benefits gained by our agency and ORPOS employees, we at the Board remain committed to eliminating the compensation and benefits gap between our agency and the other Federal financial regulatory agencies. We continue to believe that all these agencies should be treated with parity.

IX. REGULATORY DEVELOPMENTS

The Bank Board attained some historical regulatory benchmarks in 1986. I will briefly describe three of the most significant regulatory amendments adopted concerning the regulatory capital rule, the regulation governing conversions of thrifts from the mutual to stock form of ownership, and the direct investment regulation. In addition, I will briefly describe a policy statement recently adopted by the Board concerning supervisory policies affecting FSLIC-insured institutions that have been adversely affected by economic conditions in the oil and gas, agricultural, natural resources and other distressed sections of the economy.

A. Capital Regulation

The net worth and liability growth regulations were developed by the Board in consultation with its field staff, and were formally adopted by the Board in January 1985. They curtail overleveraged deposit growth and require institutions to increase their capital as they increase their deposits. On August 15, 1986, the Board again in close consultation with senior supervisory agents in the field, amended its net worth and growth regulations by building upon their basic frameworks. The amended net worth regulation, now referred to as the capital regulation, gradually increases the industry's required capital ratio to 6 percent of liabilities at a rate feasible for insured institutions, requires incremental capital for higher credit risk assets, rewards low interest-rate risk, and gives greater latitude to well capitalized institutions.

B. Mutual to Stock Conversion Amendments

As described in greater detail in the next section under the caption, "Mutual to Stock Conversions," the Board during 1986 adopted extensive amendments to the regulations governing mutual-to-stock conversions. The amendments are designed to clarify several of the policies and interpretations of the Board, to expedite the processing of voluntary supervisory conversions and modified conversions, and to encourage insolvent and financially troubled insured institutions to use the voluntary supervisory conversion procedure to raise needed capital.

These amendments (i) provide increased protection to newly converted institutions from changes in control that may disrupt the transition into the stock form of ownership and the prudent deployment of conversion proceeds; (ii) clarify issues relating to stock purchases by management of converting institutions; (iii) provide additional incentives for insured institutions and other acquirers to participate in merger conversions with insolvent institutions; and (iv) make the voluntary supervisory conversion and modified conversion procedures more attractive to management of insured institutions and potential acquirers.

C. Direct-Investment Regulation

On February 27, 1987, the Bank Board adopted a final rule that significantly alters the existing rule on the allowable scope of direct investment activities by FSLIC-insured institutions. I believe the rule that the Bank Board ultimately adopted represents a significantly stronger and more comprehensive regulatory approach to direct investments; the approach differentiates between weaker and more strongly capitalized institutions. A comparison between the former rule and the newly adopted regulation highlights these improvements.

The former direct-investment rule established a series of supervisory thresholds for asset concentration in direct investments. Institutions were required to obtain prior supervisory approval to engage in direct investments beyond those pre-established thresholds. Under the former rule, institutions were divided into three classes: (1) institutions failing their minimum capital requirement, (2) institutions meeting their minimum capital requirement but with regulatory capital less than three percent of liabilities, and (3) institutions meeting their minimum capital requirement and having regulatory capital greater than or equal to three percent of liabilities.

Institutions from the first group could engage in direct investments only with prior supervisory approval. Institutions in the second group could hold up to twice their regulatory capital in direct investments without supervisory review and approval. Beyond this threshold, supervisory approval was required. Institutions from the third group, those with three percent or greater regulatory capital, could engage in direct investment without supervisory approval up to the greater of ten percent of assets or twice regulatory capital. Beyond this threshold, these institutions were also required to obtain prior supervisory approval.

The new direct-investment rule retains the framework from the previous rule but significantly revises the investment thresholds beyond which institutions must obtain prior supervisory approval for their direct-investment activities. Institutions that fail their minimum capital requirement must still receive approval for all direct investments. Institutions that meet their minimum capital requirement but have less than six percent tangible capital may hold the greater of three percent of assets or two and one-half times their tangible capital in direct investments without supervisory review or approval. Beyond this threshold, supervisory review and approval is required. Finally, institutions meeting their minimum capital requirement and having at least six percent tangible capital may hold up to three times their tangible capital in direct investments before supervisory review and approval is required.

The new rule significantly strengthens the former rule by linking review thresholds to an institution's tangible capital, rather than regulatory capital, which includes such intangible assets as goodwill and deferred loan losses. Because the Board determined that such intangible items do not adequately protect the FSLIC from losses in the context of direct-investment, the use of tangible capital in the new rule provides stronger safeguards for weaker institutions while affording greater flexibility to strongly capitalized thrifts. While under the former regulation institutions with three percent regulatory capital could hold up to ten percent of assets in direct investments without prior supervisory review and approval, under the new rule the same institution could hold only two and one-half times its tangible capital. Thus, if this institution had only two percent tangible capital, it would have a threshold of five percent of assets. Lower tangible capital corresponds to a lower threshold.

Conversely, under the former rule, an institution with six percent regulatory capital could hold 12 percent of assets in direct investments without supervisory review. Under the new rule, if this institution also had six percent tangible capital, it could hold up to 18 percent of assets in direct investments without prior approval. Higher tangible capital corresponds to a significantly higher threshold.

As was true with the previous regulation, the new rule retains the waiver provisions. That is, institutions that wish to engage in direct investments beyond their established thresholds may apply for a waiver from the principal supervisory agent (PSA) in their respective district. If the institution can demonstrate adequate expertise and if the institution has the proper controls to limit its risk exposure, the PSA may allow the institution to engage in direct investments beyond the pre-established threshold. The rule does not prohibit these activities. Instead, it merely requires those institutions that wish to engage in these activities beyond a level that is consistent with their capital level to demonstrate that such activities will not expose the institution or the FSLIC to undue risk.

The new rule also further clarifies the approval process for direct investments involving one- to four-family housing projects or government-insured housing projects. Since these projects are more standard in nature and are consistent with the mission of thrifts to provide economical home financing, the approval process is being streamlined. Less standard, non-traditional direct investments will continue to be subject to more thorough analysis.

At the same meeting at which the Bank Board adopted this final rule, the Board also issued a proposal that would further expand the scope of the direct investment rule. The proposal would define an "equity-risk investment" to include all direct investments as currently defined by the direct-investment regulation, as well as land loans and nonresidential construction loans with loan-to-value ratios greater than 80 percent or loan-to-cost ratios greater than 100 percent. These loans also would be subject to incremental capital requirements of up to ten percent as established by the regulatory capital rule.

D. Federal Home Loan Bank Board Policy Statement on Forbearance

On February 26, 1987, the Board published a policy statement concerning supervisory policies affecting insured institutions that have been adversely affected by economic conditions in the oil and gas, agricultural, natural resources and other distressed sectors of the economy. The statement outlined a capital forbearance policy designed generally to benefit insured institutions having sufficient capital to absorb loan losses and reasonable prospects to replenish capital, and reiterated previous Board statements regarding the restructuring of loans and accounting for them. The Board also reemphasized its longstanding policy that supervisory agents should not discourage lending simply because a project or collateral is located in a region affected by adverse economic conditions.

X. CAPITAL ENHANCEMENT AND CAPITAL MARKETS

A. Mutual to Stock Conversion

The Board gives high priority to administration of the mutual-to-stock conversion program under which FSLIC-insured thrifts may convert from mutual to stock form of ownership. Mutual-to-stock conversions have proven to be an extremely effective means for the thrift industry to obtain needed capital, and the $7.9 billion in capital raised through conversions from 1972 through year-end 1986 represents more than 15 percent of the aggregate regulatory capital of the industry.

The Board adopted regulations to govern its mutual-to-stock conversion program in 1974, and has continually revised these regulations to meet both its goals and the industry's needs by providing substantial flexibility to the conversion process and greatly expanding the industry's potential sources of capital.

In November, 1986, the Board adopted major and comprehensive revisions to the conversion regulations. These amendments affect the three types of conversions — standard, modified, and voluntary supervisory conversions.

With respect to standard conversions, the Board eliminated uncertainty on a variety of issues presented by purchases of stock by employee stock benefit plans, and enhanced the ability of officers, directors, and employees of an institution to acquire conversion stock through various employee stock benefit vehicles. These changes will enable such officers and employees to acquire larger ownership stakes in their institution upon conversion, serving as an incentive to convert, without undermining the basic equities in the conversion process.

The amendments also add a provision that an application to acquire more than 10% of any class of conversion stock may be denied if the acquisition would not contribute to prudent deployment of conversion proceeds. In addition, the amendments affect merger conversions with an insolvent institution, by granting to the resulting stock institution up to three years of post-conversion protection from offers to acquire more than 10% of the conversion stock.

The principal changes in the regulations governing voluntary supervisory conversions involve amending the standard for qualification for such conversion and measuring an institution's financial strength under generally accepted accounting principles, instead of regulatory accounting principles; simplifying the test for viability; and delegating authority to the staff to approve certain types of applications which do not present novel issues of law or policy.

The major amendments to the regulations governing modified conversions are similar to those adopted for the voluntary supervisory conversions.

These amendments have been welcomed and applauded by the industry and, in our limited experience under the new amendments, have encouraged more institutions to undertake mutual-to-stock conversions.

B. Developments at the Federal Home Loan Mortgage Corporation

The Federal House Loan Mortgage Corporation ("Freddie Mac"), operated under the direction of the Bank Board, continues to pioneer in tapping new areas of the capital markets in order to provide additional mortgage funds for America's home-buying public. During 1986, it significantly refined and developed its product line to further increase the flow of mortgage funds and provide thrifts with important restructuring tools.

One of the more significant developments at Freddie Mac has been its entrance into international markets, which has expanded the availability of mortgage credit while also resulting in significant savings in Freddie Mac's financing costs compared to domestic financing costs. Freddie Mac pioneered in the international markets by targeting the first international offering of a Collateralized Mortgage Obligation ("CMO") to the special needs of foreign investors. Developed by Freddie Mac in 1983, the CMO is a bond-like security with several maturity classes secured by a pool of mortgage loans. The first international issuance in November 1985 saved $5.7 million over a similar domestic issue. In April 1986, Freddie Mac saved $11 million by targeting two classes of a CMO offering to foreign markets. Freddie Mac also introduced to the European marketplace the first mortgage pass-through security exclusively backed by newly originated multifamily mortgage loans. Both the CMO and the European sale of the multifamily mortgage-backed security, more commonly known as a Mortgage Participation Certificate or PC, successfully tapped $734 million in additional funds internationally in order to provide affordable mortgage credit to American home buyers. In August 1986, Freddie Mac began to conduct regular auctions of these securities.

Freddie Mac was also the first to respond to another need of the mortgage finance industry last year when it introduced the first mortgage pass-through security backed by adjustable rate mortgage loans ("ARMs"). The ARM security, along with Freddie Mac's ARMs purchase programs, provides lenders with greater flexibility in originating and selling ARMs into the secondary mortgage market.

Following its tradition of successful product innovation, Freddie Mac in January 1986 announced a new second mortgage purchase program. As a result of careful underwriting and program design, Freddie Mac is able to provide interest rates on second mortgage loans that match those of first lien mortgage loans, and provide additional liquidity for lenders who originate second mortgage loans.

C. The Federal Home Loan Bank System

The twelve FHLBanks, which are regulated by the Bank Board, together represent one of the strongest central credit facilities in the world. With assets of $131 billion and a capital-to-assets ratio of almost 9 percent, these institutions earned a record $1.4 billion in 1986 and paid out over $900 million in cash and stock dividends to member thrift institutions in 1986.

The total debt outstanding of the FHLBanks, as of February 28, 1987, was $91.3 billion, with deposits placed by members in the FHLBanks totaling $23.9 billion on February 28, 1987. Loans outstanding made to member thrifts were $104.4 billion on February 28, 1987.

The FHLBanks accessed the domestic and international capital markets with varied types and maturities of securities to an unprecedented degree last year. These varied funding sources provide members with the opportunity to select the most suitable liabilities for their portfolios for asset/liability matching, restructuring, and liquidity purposes. The FHLBank's programs consistently provide members with a full range of borrowing maturities, from overnight to ten years. Total debt sold in 1986 was slightly more than $58 billion. As you are aware, these are not full faith and credit obligations of the United States government and, therefore, are not included in the Federal debt. Approximately 57%, or about $33.3 billion, consisted of conventional, domestic consolidated bonds, ranging in maturities from six months to ten years. Discount note sales for the year were $25.2 billion, averaging 190 days in maturity and bearing an average spread over Treasuries of 14 basis points.

The weighted average rate on consolidated bonds sold this year declined 195 basis points to 7.54%. The FHLBanks extended the weighted average maturity of consolidated bonds issued from slightly less than 3 years in 1985 to 5.3 years in 1986. The weighted average spread on bond issues this year was approximately 38 basis points. This is somewhat higher than 1985's 19 basis point average, in large part due to the emphasis placed on borrowings in the seven to ten year sector.

The FHLBanks continue to pursue alternatives and supplemental debt financing whenever cost effective opportunities exist. Both fixed and floating rate instruments are being evaluated on an on-going basis. The FHLBanks will issue such debt when market conditions for a given instrument are favorable enough to provide some cost savings to the FHLBanks and attractive advances to members.

The FHLBanks are very careful to protect their sound financial condition, because a strong credit rating is essential for their access to the capital markets. Accordingly, there is a limit to the extent they can cooperate with the FSLIC in forestalling liquidity problems of troubled FSLIC-insured institutions, as discussed above in Part B, the State of the FSLIC Fund. In order to maintain their ability to access the capital markets, the

FHLBanks generally no longer make unsecured advances to troubled institutions, because the FHLBanks' independent auditors have questioned the value of the guaranties of the FSLIC, when it is insolvent.

XI. CONCLUSION

In summary, the thrift industry continues to recover, slowly, and not uniformly, from historic losses caused by the high inflation and high short-term interest rates of the early 1980's. Of more imminent peril to the industry and particularly the FSLIC fund are the severe asset quality problems of a small minority of the industry that are now threatening the remaining resources of the FSLIC.

We at the Bank Board are devoting our utmost energies towards enactment of FSLIC recapitalization. As in recent years, I ask for the Congress' assistance in providing the Board with sufficient budget and personnel flexibility today so we can deal effectively with the critical situation facing the thrift system under our jurisdiction. This year, however, I ask for more. I urgently request the Congress' support in ensuring the viability of that system for tomorrow, by recapitalizing the FSLIC fund without further delay.

APPENDIX A

FSLIC-Insured Institutions' Eligibility to Convert

	Criteria	Number	% of Total Assets of FSLIC Insured Institutions
A.	FDIC net worth definition: 6% net worth with 1% loan loss reserve	952*	12.99
B.	Criteria met only if specific reserves included in general reserves	1039**	15.96
C.	Criteria met only if capital added (Net worth> 5% but< 6%)	1291	23.65

*Includes Citicorp institutions ineligible

**Includes some institutions under management consignment program

APPENDIX B

EXIT FEES

According to FHLBB data, the savings and loan business as a whole earned .39% average return on total assets (ROA) in 1985. An institution paying an exit fee of 2 times regular and 2 times special assessments would pay more than the industry earned on average on its assets in 1985. The sacrifice of an entire year's earnings is not insubstantial. Also, the industry had a return on equity of 9.37% for 1985 (ROE). For an institution with $50 million assets and contemplating a change in insurance of accounts these ratios would mean the following:

1985		EXIT FEES		
ROA(.39%)	ROE(9.37%)[1]	2+2(.42)	3+3(.625)	4+4(.832)
		$50,000,000		
$195,000	$140,550	$210,000	$312,000	$416,000
		$100,000,000		
$390,000	$281,100	$420,000	$624,000	$832,000
		$1 Billion		
$3.9 ml	$2.81 ml	$4.2 ml	$6.24 ml	$8.32 ml

According, at a level of exit fees (2+2) a savings and loan would be required, on average, to pay 3 basis points more than the industry's average 1985 earnings as a penalty. At the higher levels the magnitude of the penalty is even more dramatic reaching nearly 160% of ROA at 3+3 and 210% of industry ROA at 4+4.

The industry's ROA, according to FHLBB data, in 1986 is trending lower than 1985. In 1986 ROA, available was .23 in the third quarter.

Finally in 1985, average net worth for all FSLIC insureds was 4.4% of liabilities. An exit fee of 2+2 is .42 basis points meaning that an institution seeking to exit would sacrifice 10% of its net worth to do so and nearly 20% of its capital at the 4+4 figure.

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[1] Presumes net worth is 3% of liabilities.

APPENDIX C

RATES OF RETURN FOR HIGH NET WORTH FSLIC INSURED INSTITUTIONS IN RELATIONSHIP TO VARIOUS LEVELS OF EXIT FEES

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1986

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FIRMS WITH FDIC CAPITAL BETWEEN 4% AND 6%

				Exit Fees		
Return on Assets	Return on Equity	2+2	3+3	4+4	5+5	6+6
.85%	16.85%	.42%	.625%	.833%	1.0416%	1.25%
		(49% of INC.)	(74% of INC.)	(98% of INC.)	(123% OF INC.)	(147%-OF INC.)
Profits for $50 million firm						
$425,000		$210,000	$312,500	$416,500	$520,800	$625,000
Profits for $100 million firm						
$850,000		$420,000	$625,000	$833,000	$1,041,600	$1,250,000

APPENDIX C CONT'D

Profits for $1 billion firm						
$8,500,000		$4,200,000	$6,250,000	$8,330,000	$10,416,000	$12,500,000

FIRMS WITH FDIC CAPITAL OVER 6%

		Exit Fees				
Return on Assets	Return on Equity	2+2	3+3	4+4	5+5	6+6
1.30%	16.10%	.42%	.625%	.833%	1.0416%	1.25%
		(32% OF INC.)	(48% OF INC.)	(64% OF INC.)	(80% OF INC.)	(96% OF INC.)
Profits for $50 million firm						
$650,000		$210,000	$312,500	$416,500	$520,800	$625,000
Profits for $100 million firm						
$1,300,000		$420,000	$625,000	$833,000	$1,041,600	$1,250,000
Profits for $1 billion firm						
$13,000,000		$4,200,000	$6,250,000	$8,330,000	$10,416,000	$12,500,000

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Senator PROXMIRE. Thank you, Mr. Gray, and thanks for making your statement so concise and to the point.

In the body of your statement, you indicate that the Senate-passed recapitalization bill fails to resolve effectively FSLIC's financial crisis and go on to say, "Neither the House nor Senate bill provides even enough additional funds to deal with FSLIC's insolvency as of the end of 1986."

You told the House Appropriations Committee on March 5 that the plan you are advocating will not allow the FSLIC to sell bonds to investors in excess of $3 billion a year. Since we gave you the authority to raise $7.5 billion, doesn't that give you what you wanted but over a shorter period of time, 2½ years instead of 5 years?

Mr. GRAY. Let me make it clear. We are happy for whatever we can get. All we are trying to say is that to send a signal to the financial community and the American public that, indeed, there is a long-term program, which has money to deal with this problem, which is consistent with what we have tried to propose, would be more helpful.

Senator PROXMIRE. You are absolutely right. But you see, the argument behind this was that in view of the problems involved here, Congress ought to watch it closely, and one way of doing that is to have you come back every couple of years.

Mr. GRAY. I understand that. I would prefer the other approach. Frankly, you and Senator Garn, and a number of other people, even voted earlier for a $10 billion plan, which I think would have been better, but it didn't carry the day.

Senator PROXMIRE. I voted for $10 billion, and it lost on a tie vote.

Mr. GRAY. That is right. It didn't carry the day, unfortunately, but that would have been closer to $15 billion, and it would have been better. You tried, and we appreciate that very, very much.

Mr. WHITE. Mr. Chairman, I would like to expand a little bit and follow up on what Chairman Gray just said.

We understand your concerns about oversight, and about asking us to come back, but I think the Congress needs to understand that there may well be extra costs that are thereby imposed onto the system. There may well be higher borrowing costs for a smaller program as compared with the larger program. Also there are extra planning costs on the FSLIC.

Senator PROXMIRE. On the other hand, you see, the political problem, you understand it better than I do.

Mr. WHITE. We understand.

Senator PROXMIRE. The fact is that the savings and loan people are active, interested, and concerned. As I indicated, and I am sure you would agree, most of the savings and loans are doing well. Therefore, we didn't want to impose a burden that was so heavy that it would result in our losing some of these institutions.

Mr. GRAY. Mr. Chairman, let me address what I am so concerned about. We are running right now in net operating losses alone about $4 billion a year. These are costs that will have to be repaid some place. They are net operating losses alone.

If that were to continue, and we think that it will probably get worse, that is going to be $8 billion that we are going to have to deal with. Even in the plan that you have proposed, or the Senate has provided, it is $7.5 billion. This is a real concern for us as head of the FSLIC as we look to resolve this problem.

One of the reasons that we are going to continue to have those net operating losses is because there will be institutions out there that are massively insolvent and continue to contribute to this problem. It is a very difficult problem, and everybody needs to be aware of it.

By the way, that is double what we were talking about just last year. At that time, we were running net operating losses in these severely troubled institutions of about $2 billion a year, and it is now at almost $4 billion a year, and we think that it is going to increase, and that is a problem.

TWO-YEAR APPROPRIATIONS BILL

Senator PROXMIRE. Let me just take a minute to get into something that is a little more routine. Senator Domenici, who is a member of this subcommittee, has asked us to explore the possibility of passing 2-year appropriations bills. Would that approach create any particular problem for your agency, or do you see a benefit in having to justify your budget only once every 2 years?

Mr. GRAY. I wasn't ready for that question.

Let's, first of all, ask our Budget Director.

Do you have any thoughts?

Mr. PITTMAN. Mr. Chairman, I don't think that it would pose any problem because we are basically reviewing, on an annual basis, just the administrative expenses of the agency, and not the FSLIC resolution budget. I think on a 2-year basis it could be very easily accommodated.

Senator PROXMIRE. In an agency that I think has a fine director, but has had problems, it would probably be desirable for us to have oversight anyway. I don't think that it would be necessary for us to have an annual budget in order to impose that discipline. We certainly wouldn't want to make exceptions; we would want to treat everybody alike.

Approximately what proportion of your annual appropriation request do you consider to be simply a repeat of the prior year's submission?

Mr. PITTMAN. I would say that the base of each year's incremental increase is about 94 or 95 percent of the previous year, with the other 5 percent being cost level increases.

Senator PROXMIRE. Would you expect to realize any budget savings if you could plan on a 2-year basis? If so, could you estimate what the savings might be?

Mr. PITTMAN. I could try to provide that for the record.

Senator PROXMIRE. Would you do that for the record?

Mr. PITTMAN. Yes, sir.

[The information follows:]

BIENNIAL BUDGETING

Biennial budgeting would be of assistance to the FHLBB by providing the capability to budget over a 2-year period. We particularly foresee the potential of at least marginal cost savings in the area of contractual services. The new budget cycle would allow more time to perform all the remaining aspects of the agency's mission to regulate the savings and loan industry.

SUPERVISORY CASELOAD

Senator PROXMIRE. Chairman Gray, on March 5 of this year in testimony before the House Appropriations Committee, you talked of a significant supervisory caseload of 347 institutions with 167 of those thrifts being FSLIC cases. That was on March 5.

Mr. GRAY. Right.

Senator PROXMIRE. On the other hand, your prepared statement for today's hearing talks about 182 FSLIC cases as of December 31, 1986, that was earlier.

Mr. GRAY. Right; and now we have at least 191.

Senator PROXMIRE. That is confusing, because the 167 was after the higher figure. It looked like you were able to reduce the caseload by roughly 10 percent between December 31 and March 5, and now it is going up again.

Mr. Gray. That, I think, would have been inadvertent. If there had been an error in our presentation of those figures, we apologize. But I believe, correct me if I am wrong, that those figures have continued upward in terms of institutions that have been transferred to the FSLIC.

Mr. CONNELL. Mr. Chairman, what was the number you said at the end?

Senator PROXMIRE. March 5, 1987.

Mr. CONNELL. What was the number that you compared to say that it was going up?

Senator PROXMIRE. The number that I compared it to was 182. The 182 is in the prepared statement as of December 31, 1986. Then a little over 2 months later, you said that it was not 182, but it was 167.

Mr. CONNELL. I believe the December number would have been incorrect, Mr. Chairman.

Senator PROXMIRE. Thank you.

FEDERAL SAVINGS AND LOAN INSURANCE CORPORATION CASES

Are you projecting an increase in your FSLIC cases over the next few months, or is the situation improving?

You just told us 192 is what you expect now, but can you anticipate what is likely to happen; does it look it better or worse, or about the same?

Mr. GRAY. Not as good.

Mr. WHITE. Let me add to that, Mr. Chairman, that it at least partly depends on when and how much we get in the way of recapitalization, because to the extent that we can move cases out of the caseload, that diminishes the number. To the extent that there are further problem thrifts that move into the system, that increases the number if we are not moving any out, and the number surely has to go up. To the extent that we can move cases out at about the rate they come in, the overall stock of cases would remain about the same. It will really depend on how quickly we get recapitalization.

Mr. Gray. Mr. Chairman, if I may, I want to make it very clear where the Bank Board stands on one thing we were talking about. We were talking about the amount of bonding that could be provided, the political implications, et cetera, et cetera. I just want to make it clear that from the Bank Board's point of view, we are absolutely willing and we invite strong and complete oversight by the Congress in how those funds are utilized.

We believe, as the Congress does, I am sure, that that is very, very important.

NEWSPAPER ARTICLE REGARDING CONGRESSMAN DINGELL AND FHLBB

Senator Proxmire. Have you had a chance to see yesterday's paper, and the article that quoted Congressman Dingell with respect to the Home Loan Bank Board?

Mr. Gray. Yes.

Senator Proxmire. Let me read part of that, and it would be very helpful if you could give us a response. It reads as follows:

> The Federal Home Loan Bank Board has had knowledge of and involvement in securities fraud among the savings and loans that it oversees, and should no longer be allowed to regulate the securities activities of the S&L industry.

A congressional subcommittee said yesterday:

> "I believe this scandalous conduct fatally undermines any argument that the Bank Board can be relied upon to enforce the Federal securities laws adequately," Representative John Dingell said in a report released by the House Energy and Commerce Committee's Oversight Subcommittee

Dingell, of course, is the chairman.

> The subcommittee report recommends that Congress transfer oversight of securities disclosures by S&L's and banks to the Securities and Exchange Commission. The report said that securities disclosure is now divided among the Bank Board and three agencies that regulate commercial banks and should be consolidated in the SEC. The report also blamed the Bank Board for allowing S&L's to use misleading accounting rules, the committee said, that duped many of the shareholders in the nation's 300 publicly traded S&L's and added billions of dollars to the government's cost and closing hundreds of ailing S&L's.

What is your response to that?

Mr. Gray. In some 43 pages, we tried to answer that yesterday. In the hearing itself, we were not really asked very many questions. It was an interesting hearing in that regard; it was a statement at the outset.

Let me try to get a concise answer for you. I want to call on Mr. Black, who is somewhat better at that than I am, Mr. Chairman.

Senator Proxmire. Would you send us a copy of that 43-page response? We haven't seen it.

Mr. Gray. Yes, I would be happy to.

We obviously disagree. Those hearings have gone on for some 2 years. There is a difference of opinion, and I expect that it is an honest difference of opinion. We think that we more than adequately answered the concerns that were raised in the series of hearings, as well as specific concerns raised yesterday.

I might point out that the issue was narrowed to one institution, Mr. Chairman, really one institution, and it happened to be American Savings in Florida.

Senator PROXMIRE. I am puzzled about this. It was just called to my attention about 1 minute before I asked the question, unfortunately, and I hadn't seen it before. I didn't read the article yesterday. It was shocking, and I thought I would give you an opportunity to respond.

Mr. GRAY. Thank you very much.

Mr. BLACK. The most that exists at this point is a draft staff report and Chairman Dingell has indicated that he may well not agree with a number of things in the draft in discussions yesterday, as I understand, with the Board members. The headline doesn't come from that draft report, so I don't know whether Chairman Dingell really agrees with the things that are reported.

I think the concise answers are in reverse order. We have always used GAAP, generally accepted accounting principles, for all securities filings. The shareholders receive GAAP financials if they are any publicly traded company, and we automatically incorporate what is called rule SX of the Securities and Exchange Commission. So we use the identical accounting standards that they do.

In addition, the Bank Board has a proposed regulation out, with the comment period closed, which would call for all publicly disclosed financial, counter statements, everything else, even from mutual associations, to be done on a GAAP basis.

The staff strongly recommends that, and hopes that the Board will agree with our arguments, perhaps as early as next month, on the securities jurisdiction. As I said, we use the same standards that the SEC uses. We have very experienced attorneys, many of whom came from senior positions in the SEC.

Unlike the SEC, because we have decided that the process of raising capital in this industry is so critical, and that accurate disclosures are essential to public confidence in raising of capital, we have assigned sufficient attorneys and accountants to do a 100-percent review of securities filings, and that compares to the GAO report to Representative Dingell that the SEC is able to review only 13 percent of all filings. So we think that there are important advantages on the securities side.

On the so-called allegations about fraud, again, it is my hope that no final committee report is going to have any such allegation. The record before the committee has no basis for such a statement.

DINGELL NEWSPAPER ARTICLE

Mr. WHITE. Mr. Chairman, just let me add two things. As both Chairman Gray and I indicated in our statements to Chairman Dingell's subcommittee yesterday, the Bank Board has special obligations with respect to the FSLIC insurance fund, and we believe that securities oversight is very important to make sure that securities arrangements do not endanger thrifts, put them at risk in some fashion that would thereby endanger the FSLIC fund.

Senator PROXMIRE. It certainly seems logical to me that the Home Loan Bank Board should be the organization which regulates the thrifts. We have too many regulators involved now. My feeling is that we should have one regulator for the whole financial operation. But to get the SEC involved and the Home Loan Bank Board, then, of course, there are other agencies involved in other ways.

Mr. GRAY. Mr. Chairman, you are absolutely right. I agree with you. I have taken that position for 2 years, going back to the Bush task force report. I will just say this, and I don't want to be inflammatory in any way, but we do, as you will see from our testimony yesterday at that hearing, and the whole hearing record completely rejects any suggestions that there are even deficiencies at the Bank Board with respect to securities regulation in terms of thrifts, and we think we are doing a good job.

Occasionally, there is a case, under delegated authority, that doesn't always go exactly the way we might want it to go. There is one case where there is a difference of opinion between this House subcommittee staff and the Bank Board, but that certainly does not establish any sort of pattern.

Mr. WHITE. Further, even if one might concede, with this difference of opinion, that something might have gone wrong, anyone who suggests change must not only show that there were mistakes, but that it would be less likely that mistakes would be made under the new organization, and that the Bank Board's obligation to protect the FSLIC could also be met without undue consequences of extra cost, extra delay for us and for the industry, and the House subcommittee draft report really did not meet those concerns.

Mr. BLACK. The one incident that that headline possibly could come from had nothing to do with the securities filing. It had to do with a regulatory approval not of a securities filing at all, but of a particular arrangement in which Warner was bought out—Warner is probably a famous enough name—was bought out of an ownership position in American Savings and Loan. There was no credible suggestion that securities fraud against the Bank Board is remotely possible.

COST TO RESOLVE INDUSTRY PROBLEMS

Senator PROXMIRE. In January, you told the Senate Banking Committee, on which I serve, that it would cost $23.5 billion to resolve the thrift industry's known problems; $23.5 billion. What is your latest estimate?

Mr. GRAY. When you get into those figures that is high enough to become a bit speculative.

BOOZ-ALLEN STUDY

Senator PROXMIRE. In your prepared statement, you refer to an in-depth interview of your FSLIC case resolution and receivership operations. Was that review a response to the Booz-Allen study of FSLIC management?

Mr. GRAY. Shannon.

Ms. FAIRBANKS. This was a followup to an initial review that had been provided. The Booz-Allen review was the initial review, then there has been a further review within the system.

Mr. GRAY. We, of course, made that available to you, that Booz-Allen report.

Senator PROXMIRE. As you indicate in your testimony, you have appointed a task force to work on plans to implement the findings arising out of the in-depth review and the task force has completed its study. When will the Board finish its review of the task force's recommendations and when will the Board take any action to implement reform? Can you tell us what your timetable is?

Mr. GRAY. I am very, very hopeful that it will be very, very soon.

Senator PROXMIRE. What does that mean?

Mr. GRAY. That means this week or next week.

Senator PROXMIRE. Next week?

Mr. GRAY. Yes.

TRAVEL AND ENTERTAINMENT EXPENSES

Senator PROXMIRE. Mr. Gray, I have always considered you an honest, able, and intelligent man. You have been criticized, as you know, on travel and entertainment. I would like you to tell us—I understand that you will be leaving your chairmanship in a few weeks—what standards do you feel your successor should establish and follow for travel and entertainment expense?

Mr. GRAY. Mr. Chairman, those standards have been set forth in two Chairman's orders that have been issued by me. Chairman's Orders No. 700 and No. 702, which were issued last December.

I regret my own lack of attention to the problems which were in part matters of perception in the earlier years of my tenure. I made substantial reimbursement for costs that were incurred. Frankly, I was operating in just the same way as my predecessors, I thought.

It is true that we had more travel in these last few years because of my desire to try to incorporate the full system and the resources of the full system into our means of dealing with the problems that we were facing. That did require a good deal of travel, particularly to bank president meetings. We had a legal opinion in 1984 by the General Counsel, which we were following, and this was a legal opinion that followed an earlier one by Tom Vartanian in 1981, the General Counsel for then Bank Board Chairman Pratt.

I think what happened was healthy. Unfortunately, I bore the brunt of this, even though these practices had gone on for many, many years with my predecessors. I think that it is time that the kind of actions that we took be put in place. I think they are appropriate, and I see them as being appropriate in the future for my successors.

Senator PROXMIRE. You see, what I am talking about is not simply travel. I think that travel sometimes is absolutely essential, and you can't be a vigorous and effective Chairman unless you get out in the field, and not try to run everything by telephone back here in Washington.

I am not talking about that. What I am talking about is items such as $6,294 for a cruise on San Francisco Bay, $5,856 for dinner aboard the *Spirit of Charleston*, $744 for a stolen wallet, which is something else, and personal items such as beauty salon appointments and massages, hotel bills for as much as $649 a night. That kind of thing would strike some Puritans——

[Laughter.]

Senator PROXMIRE. A great definition for a Puritan is the kind of person who has a haunting fear that somewhere, someone is happy.

[Laughter.]

Senator PROXMIRE. You can understand why the public, in looking at that, would have a perception, at least——

Mr. GRAY. Absolutely. I agree with you about the massage at my hotel in Japan which is a very common thing in Japan, I gather.

[Laughter.]

Mr. GRAY. Let's just take some of the things that you have mentioned. The so-called cruise on San Francisco Bay was a trip that was planned by the bank presidents in honor of the departure of former Board member Don Hovde, and it was in connection with the bank presidents meeting there. I almost didn't go, as a matter of fact.

Senator PROXMIRE. What concerns me is not what happened, the massage, or the trip on San Francisco Bay, it is who pays for it.

Mr. GRAY. That is exactly right, and that is why the actions that have been taken in the orders that I issued will prevent that from happening in the future. That is the point.

Senator PROXMIRE. You are confident that this will not happen again?

Mr. GRAY. I don't see how it can happen without directly violating both the letter and spirit of those Chairman's orders.

EXAMINATION AND SUPERVISORY STAFF INCREASES

Senator PROXMIRE. Mr. Gray, on page 15 of your prepared statement, you indicate that you have doubled your professional field examination staff in just 1½ years and tripled your professional supervisory staff since 1984. Can you tell us why you found it necessary to increase your supervisory staff at a faster rate than your field examination staff?

Mr. GRAY. The field examination staff, when you consider the fact that we have doubled it in 1½ years, and we tripled the supervision staff in about 2½ years, the timeframe was different. I think that we have moved extremely quickly in our examination staff.

When you consider the fact that 3 weeks before we were going to transfer our examiners, Mr. Chairman, I had the Associate Director of

OMB come over to talk to former Board member Don Hovde, myself, and former Board member Mary Grigsby, and say: "If you agree not to transfer these examiners"—there were 750 then—"to the Federal Home Loan Banks, we will give you 39 new examiners". We, of course, have gone from 747 to 1524 just in 1½ years, and we are increasing that. I think that the mix is appropriate because I think that supervision out in the Federal Home Loan Banks was not nearly as strong or as great as it should have been.

Senator PROXMIRE. Have the two staffs increased at the same rate over the past 2½ years?

It was an unfair question because I compared one period of time with a different period. Have they been about the same?

Mr. GRAY. Yes, they are roughly the same, but let me go beyond that, since you mentioned supervision. We have stolen, if you will, quite a few of the very top people at the Comptroller of the Currency, and several other regulatory agencies, to try to further professionalize our staff out in the Federal Home Loan Banks, and I am very proud of that.

Senator PROXMIRE. Would you compare the two over the last 2 years and the last 2½ years?

Mr. GRAY. Sure, I will be happy to.

[The information follows:]

EXAMINATION AND SUPERVISORY STAFF

To get the most informative comparison of the relative increases in the professional examining and supervisory staffs of the Federal Home Loan Bank System, the data should be those since mid-1985 when the examination function was transferred to the banks. Prior to that time, we had to cope with two systems that differed as to operational organization, budget, and flexibility.

Professional examination staff

June 30, 1985	747
December 31, 1985	1,003
December 31, 1986	1,524
Percent increase from base	104.0

The banks were instructed to commence building up their supervisory staffs in April 1984, and did start that process. Although available bank system personnel data prior to June 1985, are not fully reliable for direct comparison purposes, we estimate that the following is a reasonably accurate record of the growth of professional supervisory personnel:

	Total professional supervisory staff	Professional supervisory enforcement staff
April 30, 1984 (approx.)	215	157
June 30, 1985	316	242
December 31, 1985	338	346
December 31, 1986	550	451
Percent increase from base	255.8	287.3

Supervisory personnel consists of both supervisory enforcement staff and supervisory applications staff. The enforcement personnel, obviously, were the staff that were critical to stopping and preventing unsafe and unsound practices threatening the FSLIC fund. As the above chart indicates, the Home Loan Banks, under Chairman Gray's direction, have almost tripled these personnel since April 1984.

NATIONAL ASSOCIATION OF STATE SAVINGS AND LOAN SUPERVISORS TRAINING

Senator PROXMIRE. As you know, your fiscal year 1988 request assures a budget of $500,000 for the training of state training and loan examiners, a reduction of $300,000 in a current $800,000 training budget.

The National Association of State Savings and Loan Supervisors has taken strong exception to that proposal. They point out that tuition charges have increased dramatically in the past few years. As a result, fewer examiners are being trained. For example, in 1984, 591 students were trained at a cost of $500,000, while it will cost $800,000 to train 322 students in 1987, 3 short years later.

Obviously, a reduction in the training budget will reduce even further the number of state examiners that can participate in training courses next year.

Mr. GRAY. We disagree with OMB.

Senator PROXMIRE. What was that?

Mr. GRAY. We disagree with OMB. We would like it to be $800,000.

Senator PROXMIRE. You disagree with the figures?

Mr. GRAY. No; we think we need $800,000 for the training.

Senator PROXMIRE. Let me repeat the fact. In 1984, almost 600 students were trained at a cost of $500,000, and it will cost $800,000, a $300,000 increase, a roughly 65-percent increase, to train a little more than half as many students. Why is that?

Mr. GRAY. Let me ask Dennis.

Mr. PITTMAN. I can only speculate, Mr. Chairman, that the nature of the courses that they now provide in some of the investment areas relating to the new powers of the savings and loans, the duration of each individual class is now longer, more complicated, and more expensive.

Senator PROXMIRE. All right, that may be satisfactory. Will you give us, for the record, the details on that?

Mr. GRAY. Yes.

[The information follows:]

STATE EXAMINER TRAINING

There are a number of details on why it will cost $800,000 to train 322 state examiners in 1987 compared to a cost of $500,000 to train 591 state examiners in 1984. In 1984, the majority of state examiner instruction was subsidized by the Bank Board whose examination personnel taught without charge as members of civil service. Thus the individual tuition charge for a 3-week training session was $325, whereas the actual cost of the instruction alone exceeded $1,000. The effect, therefore, was that the actual Bank Board cost was significantly understated before mid-1985. In July 1985, the examination function was removed from civil service and placed under the Federal Home Loan Banks. The Board discontinued the practice of subsidizing training and tuition charges were calculated to include all direct costs of providing the training.

ADMINISTRATIVE LIMITATION SAVINGS

Senator PROXMIRE. Mr. Gray, in fiscal year 1986, the Board failed to spend $2,774,000 of its administrative expense limitation. The Board is to be congratulated for achieving those savings, but can you tell me how you did it?

Mr. PITTMAN. Mr. Chairman, the savings are a one-time thing due to the fact that we had some pending staff increases that had been approved by the Office of Management and Budget, but to bring the recruitment of these additional people on board, we were awaiting a budget supplemental that we needed for that year. The supplemental did come, but it was relatively late in the summer, and by that time there was the usual recruiting lag time to bring the people on board, and not all of those payroll related dollars got spent before the end of the year. It is a one-time savings.

OFFICE OF ENFORCEMENT

Senator PROXMIRE. In 1986, you carried a total of 28 full-time equivalent positions in your Office of Enforcement. Your 1987 staffing estimate is for 49 full-time equivalent positions, nearly twice as many, although your workload as displayed on page C-37 of your justification seems to have increased by less than 50 percent. Can you tell me why staffing has increased so much more rapidly than workload?

Mr. QUILLIAN. I will have to provide the workload figures for the record, sir.

Mr. GRAY. I will just answer. I think the job that the Office of Enforcement is doing is just tremendous. You know, I created a separate Office of Enforcement a year or so ago, and we have deliberately tried to build up that staff with all the problems that we have out in the field.

The analysis of the workload that you bring up, I will look into that.

[The information follows:]

WORKLOAD IN OFFICE OF ENFORCEMENT

The statement in our budget submission is only a partial measure of the workload in the Office of Enforcement. Currently, there are approximately 100 cases being investigated, litigated, or otherwise handled by the Office of Enforcement. This is a record number of cases that presently strains the resources of the Office so that it is again actively recruiting for additional attorneys and financial analysts. But beyond the numbers reflected on the following chart, the Office of Enforcement has various other substantial but less easily quantifiable duties and activities. For example, it assists the supervisory agents at the FHLBanks with negotiating supervisory agreements, and with other advice and assistance in preventing regulatory violations by insured institutions.

Another major part of the Office's work is preparing criminal referrals for action by the Justice Department. This is often done in coordination with enforcement personnel at other regulatory agencies such as the SEC, OCC, and FDIC. Enforcement also helps staff from other Bank Board offices in preparing draft regulations and guidelines. Finally, the Office of Enforcement works with FSLIC fee counsel who are pursuing civil recovery lawsuits on cases on which Enforcement worked before the institutions failed and were closed.

In summary, in order to avoid future extreme strains on the FSLIC fund like those it is presently experiencing, we need a full complement of Enforcement personnel to exercise preventive enforcement action.

ENFORCEMENT ACTIONS OF THE FEDERAL HOME LOAN BANK BOARD

Calendar year	C&D orders	Number of individuals removed and/or prohibited	Supervisory agreements	Consent merger resolutions and agreements	Number of investigations completed by Office of Enforcement	
					Formal	Informal
1980	3	1	1	6	6	10
1981	8	2	0	33	8	6
1982	13	6	5	49	10	10
1983	17	21	39	22	17	15
1984	13	22	116	38	24	20
1985	28	22	233	65	30	22
1986	58	48	214	130	30	25

BUILDING EXPENSES

Senator PROXMIRE. I note that the expenses of operating your headquarters building are projected to increase from $5.1 million in 1986 to $6.4 million in 1988, an increase of more than 25 percent. Can you tell us why those costs have gone up so sharply?

Mr. PITTMAN. Much of that increase has been in the contract services for the building operation. As a result of FSLIC liquidation staff expansion, we have had to reorganize a number of the Bank Board offices within the building, and we contracted the labor involved in those moves. We also had to increase the guard service because of the large number of staff that are working on the weekend now. For the first time last year, we began contracting our mail service in the building.

MANAGEMENT FEES AND PROFESSIONAL SERVICES

Senator PROXMIRE. Building management fees and other professional services associated with the building jumped from about $196,000 last year to a projected $272,000 in the current fiscal year, that is an increase of almost 40 percent. What accounts for that cost growth?

Mr. PITTMAN. Part of it, Senator, is that we had added an additional supervisor to the resident building manager's staff, and there are some additional expenses there. There was an additional staff year of an individual added to the contract.

Senator PROXMIRE. This is an increase $76,000; that is a well compensated individual.

Mr. PITTMAN. Like I said, not all of that was for that one individual, but that was a share of it. I will provide whatever the additional miscellaneous increases were.

[The information follows:]

BUILDING MANAGEMENT FEES

The miscellaneous increases, in addition to the estimated $35,000 in costs for a new supervisor, are as follows: An estimated $7,000 for replacement of trees and shrubbery in the building's plaza; an estimated $32,000 for major repairs to the Zamboni ice-surfacing machine, the 400-percent increase in liability insurance costs, resealing/repainting of the rink area, and normal inflation; and $2,000 to cover increases in miscellaneous building management expenses.

MAINTENANCE EXPENSES

Senator PROXMIRE. Last year you estimated building maintenance expenses of over $1 million in fiscal year 1986. You actually spent about $100,000 less than your estimate. Can you tell us why your initial estimate was so much higher than the final figure?

Mr. PITTMAN. Some of the projects involved in the building, there was a time delay as to the 12-month fiscal year, and some of that work and expense shifted into the current year compared to when we first did last year's budget estimate.

Senator PROXMIRE. On that same issue, according to your justification, building maintenance costs will increase from $928,000 last year to $1,131,000 in fiscal year 1987, an increase of about one-fifth in just 1 year. Can you tell us why?

Mr. PITTMAN. I think that the original budget estimate for 1986 was actually larger than the $928,000, and because of the delays in the implementation of some projects, costs spilled over into the current year.

EQUIPMENT EXPENSES

Senator PROXMIRE. In looking at the Board's administrative expenses as set forth in the appendix to the President's budget, I note that you spent $354,000 on equipment in 1986, although last year's appendix projected 1986 expenditures of only $160,000. Can you tell us why your 1986 equipment expenditures were twice as high as your initial estimate?

Mr. PITTMAN. We were required for 1986—in the reporting, the way we present our equipment object class in the appendix, we do it on a business budget basis—and the 1986 figure was net of depreciation expense, whereas in our budget justification, we showed the gross figure which includes the depreciation expense component.

Senator PROXMIRE. Does the depreciation difference account for the entire difference?

Mr. PITTMAN. It would account for all the difference, and some increases in our need to purchase computer equipment, Mr. Chairman.

Senator PROXMIRE. These are both from the appendix, so it looks as if somehow the depreciation got into one and not the other. How would that be?

Mr. PITTMAN. The amount of the difference between the two figures in the appendix was related to the need to purchase additional equipment, specifically micro computers for our staff.

Senator PROXMIRE. How much was that?

Mr. PITTMAN. That would be about the $200,000 difference that we were noting a few moments ago.

Senator PROXMIRE. What created that need?

Mr. PITTMAN. Yes; that is true. The additional automated workload, and the fact that the professionals are now using more personal computers at their work stations to help them do their job.

Senator PROXMIRE. So they can do their job at less cost?

Mr. QUILLIAN. In my Litigation Division, we oversee more than 100 outside counsel who oversee cases on the order of 10,000, and without the new equipment, it would be impossible for that staff to oversee that workload.

Senator PROXMIRE. You are saying that the workload is going up very rapidly?

Mr. QUILLIAN. It has been, and it has become more complicated, more difficult. We have added the staff, but without substantially adding more staff, we simply have to computerize in order to do the job.

Senator PROXMIRE. Have you appraised this on a per-case basis to determine whether your case cost is, therefore, improved?

Mr. QUILLIAN. We are doing that now, Mr. Chairman. We have been in contact in recent weeks with the FDIC, who have developed a rather good computerized case management system and cost/benefit evaluation technique that will estimate cost of case versus expected settlement amount for each case.

Senator PROXMIRE. Cost/benefit evaluation is exactly what I am talking about.

Mr. QUILLIAN. The cost analysis for each case is exactly what we are in the process of developing just as quickly as we can. But, of course, the ability to develop that computerized system itself is the reason that we are getting more computer equipment.

MICROCOMPUTER COSTS

Senator PROXMIRE. Is that a one-time cost? You buy the equipment and that is it, or do you pay for it over a period of time?

Mr. QUILLIAN. The people that I have in my office, who are computer literate, tell me that the equipment that we are getting will probably have to be replaced within a few years. As you know, the generation life of computer equipment is rather short under the best of circumstances.

We are getting the best equipment we can now, but as we increase our staff, which we think we will, and as our staff, which are not now computer literate, become more computer literate, I think we are going to need even more and better computer equipment.

Senator PROXMIRE. This sounds to me like exactly the kind of situation where we need an appraisal to determine whether or not you are saving money by making this investment or not. It seems that with the rapid obsolescence of the computer equipment and the necessity of constantly buying more, that it might be a situation where the cost will be greater than the benefit.

Mr. QUILLIAN. Mr. Chairman, we are talking here about microcomputers, and you can buy a lot of microcomputers for the cost of one lawyer, when you count the compensation.

Senator PROXMIRE. That is a pretty persuasive argument. [Laughter.]

Ms. FAIRBANKS. Mr. Chairman, could I just interject here?

Senator PROXMIRE. I have a staff assistant here, who is a lawyer, who says that you need a cost-benefit study to make sure.

Ms. FAIRBANKS. Could I just note that I think one of the related issues that you raised earlier regarding FSLIC recap is provoking a lot of our concern regarding the degree of capability that our lawyers have in their oversight capacity. I think that in terms of ensuring that we have adequate oversight, we are going to have to have the capability to monitor adequately, and that is what the computer base is supposed to provide the lawyers.

SUPPLIES AND MATERIALS COSTS

Senator PROXMIRE. Your supplies and materials budget for fiscal year 1986 also was much greater than your initial estimate. Last year, you projected expenditures of $592,000 for supplies and materials, but your actual costs were $861,000. How do you explain this increase?

Mr. PITTMAN. I can explain $100,000 of it, Mr. Chairman, as misclassification, where we determined, after the fiscal year 1986 accounting year closed, that there was $100,000 of items that were categorized as supplies from the General Services Administration that should have been categorized as equipment.

LONG-DISTANCE EXPENDITURES

Senator PROXMIRE. I note that you are projecting expenditures of $1,205,000 on long-distance calls next year, an increase of $148,000, about 14 percent, above your current budget.

Can you tell me why this part of your budget is going up so rapidly, especially in view of the fact, as I understand it, that long-distance calls are supposed to cost less.

Mr. GRAY. They are not; they are going to cost more.

Mr. PITTMAN. Despite what may be happening in the economy overall, we are finding, over the last 2 years, that the bills that we receive from the General Services Administration, for the Federal Telecommunications System, the FTS, have gone up 25 percent, from an average of 31 cents per minute a call 2 years ago to 41 cents per minute charged to us from the General Services Administration in our most recent quarterly bill.

In the last 9 months alone, the per-minute average of an FTS long-distance phone call has gone from 36 cents per minute to 41 cents per minute.

Senator PROXMIRE. So you say that you are increasing your projected cost per call of 20 to 30 percent, or something like that?

Mr. PITTMAN. It has been 25 percent over the last 2 years, Mr. Chairman.

Senator PROXMIRE. So the 14 percent is simply an indication of your expectation of how much it will increase in the next fiscal year?

Mr. PITTMAN. That is correct.

OGC TRAVEL COSTS

Senator PROXMIRE. I note that the travel costs incurred by the Office of General Counsel are expected to increase by $32,000 next year following an increase of about $28,000 this year. To put it another way, the Office's travel budget request of $258,000 represents an increase of 30 percent between 1986 and 1988.

Can you tell us why General Counsel's travel costs are going up so sharply in the fiscal year 1988 budget?

Mr. QUILLIAN. A good bit of the reason is because we have also, as shown in our justification, added to the staff of the General Counsel's Office more professionals, and more need to go out on problem case resolution assisting the FSLIC.

The FSLIC itself does not have a legal staff, except for the legal support that is provided to it by the General Counsel's Office.

CLOSING REMARKS

Senator PROXMIRE. Thank you very, very much, Mr. Gray. Would you like to make a concluding statement?

Ms. FAIRBANKS. Could I interrupt for a minute? I wanted to clarify an issue relating to your questions about the Booz-Allen and task force recommendations. The reason I want to interject here is that the press has covered this issue very closely, and I wanted to clarify very precisely our response.

The Board is not intending to implement the Booz-Allen recommendations. The Booz-Allen study included some recommendations that the Board explicitly has rejected, such as having decisionmaking for FSLIC cases cited in the district banks.

I would like to clarify that the Board is reviewing the recommendations of the task force.

Mr. GRAY. That is what I thought you meant earlier, the task force that followed the Booz-Allen recommendations. I was not talking about implementation, Mr. Chairman, in the next week or so, I was talking about completing our review of this series of task force recommendations.

Senator PROXMIRE. Very good.

Thank you very, very much for you testimony, it was very helpful, and good luck.

Mr. GRAY. Mr. Chairman, this is the last time I will be appearing before you. I want to say to you personally how very much I appreciate your understanding and your support of the Federal Home Loan Bank Board over these last four years of my tenure. I thank you very, very much, sir.

Senator PROXMIRE. Thank you, sir. You did a fine job.

Mr. WHITE. Thank you, Mr. Chairman.

NEIGHBORHOOD REINVESTMENT CORPORATION

STATEMENT OF WILLIAM A. WHITESIDE, EXECUTIVE DIRECTOR

ACCOMPANIED BY:

GEORGE KNIGHT, DEPUTY EXECUTIVE DIRECTOR/TREASURER
ROY DAVIS, DIRECTOR, FINANCE AND BUDGET

BUDGET REQUEST

Senator PROXMIRE. Our next witness is Mr. William Whiteside, Executive Director of the Neighborhood Reinvestment Corporation. It has been 6 years since I received your testimony as chairman of this subcommittee, and I am glad to have you before us again. It is rare for an agency director to remain at the helm for so long as you have. The fact that we increased your 1987 request by $3.7 million to a total of $19 million is ample indication of the fine job we think you are doing. We have great enthusiasm for your organization and for you.

This year, you will defend a 1988 budget for $18,669,000, a decrease of 1.7 percent from last year's appropriation.

Your prepared statement will be printed in the record in its entirety, and you may summarize it, if you wish. We look forward to hearing you.

Mr. WHITESIDE. Thank you, Mr. Chairman. It is a pleasure to see you again in the chairman's chair, and to report on our progress and our view of the environment in which we are operating.

SUMMARY STATEMENT

We appreciate the additional support that this committee offered us last year. An additional million dollars was provided over the recommended budget, for the NHS secondary market. That was an important addition which will be leveraged five times over in the purchase of loans from individual NHS's. These NHS's are in cities where private fundraising support has not been adequate to provide the leverage funds for that secondary market.

In addition, as a result of the increase we received, we were able to expand our work in commercial revitalization, to schedule a national NHS leadership conference which we have tried to hold every second year, and to step up our program review activities to have a more regular review of individual NHS experience.

NHS is operating now in 137 cities, serving now 239 neighborhoods. The number has increased by two neighborhoods since the submitted report was prepared. Most importantly, an additional 52 neighborhoods are now self-reliant as a result of NHS's work.

HOMEOWNERSHIP

The thing that I would like to focus on in my testimony is our estimate of the future. The last couple of years have been very good from the point of view of homeownership development in NHS neighborhoods. With the lower interest rates, it was possible to create many new homeowners throughout the NHS network.

AVAILABILITY OF LOW-INCOME HOUSING

Many tenants were brought into homeownership. But as we look at the outlook for the next generation, we see a continuation of the gap between the housing available for lower income families and the growing number of families. We also see this intensified by the unintended results of the Tax Reform Act. As housing becomes more rational by leaving out all of the tax considerations, it appears that the poor are going to pay the bill.

As they get squeezed out, there is a very real possibility that a new cycle of decay and milking of properties by slumlords will be set in motion as the properties—where rent increases are not possible—become unprofitable to the present owners and are sold to people who will take advantage of the mortgagees and of the tenants. We would be back in a situation similar to the 1960's again.

A third factor that you are well aware of is the impact of the HUD-assisted properties reaching their 20-year anniversary, and their 15-year anniversary in the case of section 8. Owners can opt out of the federally assisted system, refinance their mortgages, and rent to higher income tenants.

LOW-INCOME RENTAL HOUSING

All of these things combined have convinced us that we need to prepare the NHS network to be more active in preserving rental housing, that we need to prepare ourselves to expand our Mutual Housing Association network into a larger effort, and need to share our information about this with our oversight committees so that you can take that into consideration, and the other agencies that you have oversight over.

We have a very excellent study done by Professor Philip Clay of MIT that is still in draft form. I had hoped to be able to submit it today, but we will submit it to you as soon as it is finished. The report, "At Risk of Loss: The Endangered Future of Low Income Rental Housing," lays out in some detail the gloomy prospect for lower income rental ahead of us.

LOCAL GOVERNMENT SECONDARY MARKET

We will be submitting a report at the end of this month to the Senate authorizing committee in follow-up to discussions with the staff last year. The discussions initially centered around the question, if the section 312 rehabilitation loan program were to be discontinued, could the assets of the section 312 program be provided to the Neighborhood Reinvestment Corporation for the development of a local government secondary market, rather than letting that cash flow revert to the

Treasury. We were asked to conduct a study of the utilization of this cash flow in a secondary market for local governments, as well as providing low-cost capital for NHS's.

We have completed that study and it appears, as we have talked to cities and city representatives, that there is no likelihood that the section 312 program will not continue on. There seems to be strong support for the program in both Houses of Congress, and very strong support among the cities. I think that that source of revenue is certainly moot.

However, as we have studied the idea of a secondary market for local government, it has turned up some very interesting information. There are hundreds of millions of dollars of CDBG money that have been used by cities for loans to lower income families for rehabilitation purposes. The rates are low and the payback is slow, but it is an asset to the cities.

As the funds trickle in, the program income to cities is reapplied for community development purposes. There is a good deal of excitement among the 100 or so cities we have interviewed for the idea of being able to liquify these loans by selling them in a secondary market, and put those funds to work again actively in additional programmatic work that they are not able to fund now.

We are currently involved in an unsubsidized experiment in such a concept. The Allstate Insurance Co. has agreed to work with us to design the program and to buy the first $10 million in securities backed by local government and state government loans. Out of this, we think that we will have a model that is worthy of consideration to expand considerably as a way to really reprogram old CD dollars and do the job again in many neighborhoods.

NHS's are approaching their city governments around the country with capital-intensive projects that they have wanted to do for a long time, and there simply have not been the resources. We will be receiving joint applications from the cities and the NHS's for consideration in this Allstate secondary market pilot.

This pilot sale will be unsubsidized so there will be a sizable discount involved, but the cities are still interested. It would be our hope that this could become a regular adjunct to our work in the future and that it could be subsidized so that the cities wouldn't have to incur that severe discount.

I think that I have covered enough of the highlights of our report and I would be pleased to bring my comments to an end, and try to answer your questions.

[The statement follows:]

STATEMENT OF WILLIAM A. WHITESIDE

Mr. Chairman and members of the Committee, I would first like to thank the Committee for your support and confidence in our work in approving the Neighborhood Reinvestment Corporation's fiscal year 1987 appropriation of $19,000,000.

At that appropriation level the Corporation has been able, in addition to the output proposed in our FY 1987 Budget Justification and testimony, to capitalize our secondary market with an additional $1,000,000 for the benefit of Neighborhood Housing Services (NHS) programs in "have not cities," i.e., cities where it has not been possible to raise necessary leverage dollars. The additional capital will make it possible to replenish local revolving loan funds in the amount of approximately $5 million. In addition, the increased appropriation made it possible to modestly expand our work in commercial revitalization, to schedule a National NHS Leadership Conference, and to step up our program review activity (Neighborhood Reinvestment's principal tool for monitoring the health and productivity of local partnership organizations).

We are now in our 17th year of neighborhood revitalization work, beginning as an office of the Federal Home Loan Bank Board, expanding under the Urban Reinvestment Task Force, and operating for the past eight years as the Congressionally chartered Neighborhood Reinvestment Corporation. Today, over 2.4 million Americans whose median household incomes are 72% of the median household income for the United States live in the 237 neighborhoods served by neighborhood partnership organizations located in 137 cities, towns and counties operating in 42 states. An additional 52 neighborhoods, containing a population of over 350,000 people, have become substantially self-reliant as a result of the local partnerships' work.

In reviewing our FY 1988 Budget Justification, you may have noticed some new designations which are reflective of our effort to respond to new conditions and more accurately reflect our evolving functions. Rather than listing NHSs and Apartment Improvement Programs (AIP) separately, we are listing them all under the heading "Neighborhood Partnership Organizations." We are also combining the NHS/AIP neighborhood and city counts. Our AIP Department has now been succeeded by a small Multifamily Strategies Department with training, monitoring, research and special project responsibilities, and the Field Operations Division shares responsibility for developing NHS rental housing capacity. Our Commercial Revitalization unit has given way to a Neighborhood Economic Development and Commercial Revitalization Department, and our Owner Built Housing unit has become the Housing Development Strategies Department.

Today's economy confronts our network of partnership organizations as well as the entire country with a remarkable mix of environments. They range from the "hot" housing economies of metropolitan Washington, D.C. and New York City and much of New England and California — where vacancies are almost non-existent and affordability for middle income households is at crisis levels — to communities devastated by the farming and oil industry depressions — where vacancies are at all time highs and depressed housing prices and rents are out of reach to the swelling ranks of unemployed and low income households.

Overlaying this checkerboard of relative wealth and poverty, a combination of forces is producing — and promises to produce at an accelerating rate — a severe lower income rental housing shortage.

First, during the past ten years the percentage of the population that is poor has grown from 12% to 15% of all Americans, and during the same period the low-rent housing stock (apartments renting for $250 in 1974 constant dollars) has decreased by almost 20%.

Second is the expected impact of the Tax Reform Act on unsubsidized lower income rental housing: a) through the rent increases that will be necessary in order for owners of rental housing to show a profit as tax shelter income is reduced; b) through the anticipated displacement of lower income households; c) through the "milking" of buildings which will not support rent increases; and, d) through a lack of new production as incentives disappear for the private sector to produce new low-, moderate-, and middle-income units. While the Tax Reform Act will produce valuable results in many ways (including the removal of non-economic considerations from the private housing calculus), its affect on lower income renters, coupled with more stringent underwriting standards by financial institutions flowing from recent non-performing loan experience and greater secondary market usage, has put our housing economy on course for extensive losses of low-rent units in the unsubsidized sector; at least as large as the loss experience in the previous decade and probably more.

Third, the privately-owned, low-income rental units with project based federal assistance totalled 1,900,000 units in fiscal year 1985, and due to expiring federal contracts and use restrictions, as many as 900,000 units could be conventionally refinanced and escape federal use restrictions by 1995 -- with an additional 600,000 units at risk by 2003.

This picture is detailed by a soon-to-be-released study prepared for Neighborhood Reinvestment by Dr. Phillip Clay of the Massachusetts Institute of Technology. The study indicates that without a shift in current trends, policies or housing concepts, the combined impact of the above three forces will be a steadily increasing displacement of lower income renters. In many tight housing markets displacement will mean families relegated to substandard housing, doubled up with other households or literally homeless -- with concomitant costs in human lives, in social breakdown, and in governmental and social services.

Needless to say, Neighborhood Reinvestment's work is being impacted by the displacement of lower income renters, and to address this impending crisis we are, within resource limitations, reposturing the Corporation to help neighborhood partnership organizations cope with their increasingly hostile environments. The self-help approach of the Mutual Housing Association, which the Corporation was encouraged in the Housing and Community

Development Act of 1980 to explore, seems increasingly to be the most viable and cost-effective way of producing and operating multifamily units for lower-income households at minimum long-term costs in public subsidies.

A Mutual Housing Association is a publicly accountable, private nonprofit corporation which efficiently develops, owns and operates housing in the public interest. An Association's governing body is comprised of a majority of resident members and waiting members, as well as representatives of the surrounding neighborhood and local government, including representatives of businesses and financial institutions (similar to the partnership approach of a NHS). This, and the Association's role as developer and operator, produces a congruence of interest among the subsidizer, developer, owner, nonprofit sponsor, tenants and the surrounding community which has rarely been achieved in federally assisted housing. Also, active involvement of the present and future resident members in the development and management of the Association creates a psychological "pride of ownership" in the properties of the Association which is a factor in ensuring long-term good maintenance.

A Mutual Housing Association is committed to seeking new low-cost capital, and using all resources in excess of its operating and maintenance costs for the continued production of units for lower income households. It has the capacity to continue, in perpetuity, the operation of the units under its ownership for the benefit of its target population.

In partnership with leaders in the banking, savings and loan and insurance industries, we initiated an important tool for increasing the availability of low-cost capital. The secondary market for the NHS revolving loan fund loans operated by Neighborhood Housing Services of America (NHSA), converts the income stream from low-interest, mostly second position loans into asset-backed notes acceptable to institutional investors, and thence into cash for the NHS revolving loan funds. Last year the Senate Committee on Banking, Housing and Urban Affairs (S Rpt. 99-314) encouraged Neighborhood Reinvestment to investigate with local governments leveraging the Section 312 Revolving Loan Fund cash flow through a secondary market for local government loans. Early into the investigation it became clear that there would be no political support for anything that would result in the termination of the Section 312 Rehabilitation Loan program. We have continued to research the possibility of a secondary market for state and local governments, however, because we believe that the secondary market technique used by the NHS revolving loan funds can be utilized to make additional low-cost capital available to lower income neighborhoods by liquifying state and local government loan funds.

The Allstate Insurance Company has volunteered to assist Neighborhood Housing Services of America and Neighborhood Reinvestment in developing such a mechanism and to purchase the first $10 million in notes backed by local government loans with the condition that some or all of the proceeds be available to the local NHS in each community. We will be reporting our findings to the Senate Housing Subcommittee on May 1.

Of considerable importance to our network of neighborhood partnership organizations is a multimedia Advertising Council campaign beginning this spring in five test sites, including Washington, D.C. The campaign is expected to expand to all 137 network cities in the fall. The campaign, produced by the volunteer efforts of the Earle Palmer Brown advertising agency, features dramatic public service announcements on television, radio and in print media identifying NHSs, AIPs, and Mutual Housing Associations as part of the NeighborWorks network. The ads will bring the problems of lower income, declining neighborhoods to the attention of the broad American public, and the memorable "handle" NeighborWorks will help local programs achieve broader recognition and strengthen their base of private sector and individual contributions.

The Corporation's budget request for fiscal year 1988 is $18,699,000. This amount represents a slight decrease in our appropriated funding for fiscal year 1987.

In closing, thank you for the opportunity to present this statement. I will be pleased to answer any questions on our work and on our budget request as outlined in the previously submitted budget justification.

Senator PROXMIRE. Thank you so much, Mr. Whiteside.

You know, this is just about my favorite agency. This is terrific. It costs very little considering the enormous benefits it brings. People talk about the theory of volunteerism and getting people to volunteer assistance, but you have done it. You have made the dream come true.

NATIONAL ADVERTISING CAMPAIGN—"NEIGHBORWORKS"

One of the things that you have done, which I think is especially appealing, is your use of the media in your advertising campaign, which you showed me in my office. I wish you could have had it here today, because I think it does dramatize marvelously the way that local communities can help themselves.

You point to communities that have been deteriorating and falling into decay, in disarray, with little morale in the community, and little pride. With some assistance, they have been able to enormously improve the community, the way people live, and they have done it on the basis of some assistance from the federal government, but relatively, compared to the enormous benefits, very, very little cost.

You expect to expand this advertising program to all 137 network cities in the fall, and it is entirely on a voluntary basis. Is the federal government putting any money into this?

Mr. WHITESIDE. Yes; we are paying certain hard costs of development of the ads. The creative work of the ad agency is free, but paying the printers and paying the cameras crews, and other hard costs have to be paid with cash, but what you get for that is the very expensive talent of the agency and millions and millions of dollars worth of free air time and free space for running the ads.

Senator PROXMIRE. And an awareness on the part of people throughout the country that they can do something about their own community.

Mr. WHITESIDE. Absolutely, and that spills over far beyond NHS. This national campaign is for the benefit of the NHS's, but also of everyone who is working with low-income housing, or doing something in neighborhood revitalization. They will all benefit as a result of this campaign.

Senator PROXMIRE. It is inspiring.

I will tell you, there is a vote on the floor, and I am going to have to run to the floor to cast a vote for the Ambassador to Somalia, so it is not an earthshaking amendment, but I haven't missed a vote in 21 years, so I will have to go and vote and come right back. Stay where you are, I will be right back.

[A brief recess was taken.]

PLIGHT OF THE HOMELESS

Senator PROXMIRE. Mr. Whiteside, let me ask you a question that is a little bit off the wall, but I just wonder, because you have studied this so closely and have been on top of it, the Congress is now concerned with the homeless and the problems of the homeless.

Do you have any observations that might be helpful—I realize that your operation is quite different, but you have been so close to the housing problem, and you have been so ingenious and so effective in helping us improve neighborhoods, and all of us are very much aware now, more than I think ever in the time I have been in the Senate, of the problems of the homeless. What do you suggest we might be able to do?

Mr. WHITESIDE. I think the homeless problem is a great many problems wrapped into one. What we see are the people on the grates, the people in the soup line, the people waiting to get into shelters.

To some extent, this is a mental health problem, people being released on the assumption that they would keep getting their prescriptions filled and keep their problem under control. Without supervision, they didn't, and the problem is out of control. It seems to me that this is where some of the emphasis needs to be placed.

Another aspect that has troubled me considerably are the whole families that we see in a homeless condition.

Senator PROXMIRE. There are more homeless children now than ever before.

Mr. WHITESIDE. Right. The until recently employed people, who through loss of employment, illness, or family breakup are suddenly on the street. We are convinced that NHS's have kept people in their homes who might have otherwise become homeless, but we don't have any way to measure that.

There is one thing that is not much thought about, and it is that homeless means houseless. Not having houses has something to do with the housing stock and the availability of low-rent housing. Our sense is that we need to focus on low-rent housing and begin to think about ways to preserve the stock we have, and find economic ways to add to it.

FORECLOSURE INTERVENTION STRATEGIES

The thing that we are investigating now, and it is very complex, is whether or not we can help NHS's get into the area of foreclosure intervention on conventional loans. There have been some counseling programs funded by HUD, and some foreclosure intervention work on FHA loans, and some on VA loans. I am not aware that there has been any organized program on intervening in foreclosures on conventional loans.

We live in a changed world now where two-thirds of the conventional loans are sold in secondary markets, and a whole industry of mortgage servicers has grown up. We think that the mortgage servicers might be an organizing point for us to work on. We are presently beginning right now to establish those contacts, and to see if we might design a program, which could be funded, perhaps, by city government or foundations. The servicer would also have a self-interest in preventing the foreclosure.

Senator PROXMIRE. Let me follow up on that particular phase, because we were thinking about that and looking at the question.

I am concerned about the possibility that the current prevalance of adjustable rate mortgages, together with the practice of using second mortgage to secure general loans, may result, in the event of a recession or even a depression, which is increasingly possible in my judgment, in many foreclosures if interest rates increase sharply or if we have a significant economic down turn, or both.

I understand that you have been considering foreclosure intervention strategies. Can you tell us what mechanisms you are exploring?

Mr. WHITESIDE. The exploration is at a very early point. We are trying to discover who controls the foreclosure, who controls the process, who can decide to notify an NHS when payments are 60 days late, rather than after the foreclosure notice has already been received by the family. This would provide the NHS time to intervene.

For instance, there have been some highly publicized cases where a family has become homeless because they couldn't make payments on a $600- or $700-a-month apartment, and suddenly they are put into a $2,000 a month hotel at government expense, an insane way to do business. If there were some way that the family could have kept their apartment, or in a homeownership situation, their home for a month or two as you help them work things out, as you help them, perhaps, sell the property, rather than to go through foreclosure, and retrieve some of their equity.

There are a great many possibilities here. We are not deep enough into it yet to definitively say what kind of program we might have, but we are working on it.

Senator PROXMIRE. Very good.

IMPACT OF A 2-YEAR APPROPRIATIONS BILL

As I asked earlier, could you tell me how a 2-year appropriation bill would affect your agency? Would it create any particular problem for you, or do you see a benefit in having to justify your budget only once every 2 years?

Mr. WHITESIDE. I don't think that it would create any kind of a mechanical problem for us or be a problem in terms of our planning. The thing I would miss would be the opportunity to keep the oversight committees informed of developments, both positive and negative.

For instance, in a situation like the beginning of the savings and loan crisis, the first thing the industry cut back on was their contribution budgets. This directly affected the NHS's operating budgets which received contributions from the savings and loan industry. From the start of the crisis to the time the NHS's were seriously impacted was only 5 to 6 months.

To wait 2 years for the opportunity to inform the Congress of such a problem, discuss ways to deal with it, could affect our flexibility.

Senator PROXMIRE. That is a very constructive answer, and it is a unique answer. Of course, you could, under those circumstances, let us know and say that you would like to appear and call our attention to it, or something of that nature. But I think that the discipline would work undoubtedly better as far as your operation is concerned if you had regular annual testimony.

What proportion of your annual appropriation request do you consider to be simply a repeat of the prior year's submission?

Mr. WHITESIDE. I might mention that George Knight, our Deputy Executive Director, who was circling the airport for the last couple of hours, did arrive. Roy Davis, who was prepared to sit in for him, our Director of Budget and Finance, I suggested remain at the table. They are both prepared to help me with that question.

Mr. KNIGHT. If I understand the question, you are asking which portions of our report are basically repeats of the prior year?

Senator PROXMIRE. That is right, of the prior year's submission.

Mr. KNIGHT. The format, of course, is very similar, and the description of our mission is very similar.

Senator PROXMIRE. We are talking about dollars.

Mr. KNIGHT. In terms of dollars, sir, I think the budget is quite similar from year to year, with the exception of the grant area, in which there is a reduction due to the special $1 million recapitalization of the NHS secondary market. Also, there is a leveling out in the professional services line because no leadership conference is scheduled for 1988.

Senator PROXMIRE. Do you expect to realize any budget saving if you could plan on a 2-year basis?

Mr. KNIGHT. I would not expect to have an enormous amount of savings, sir, because of the way in which our funds are budgeted by the Board and are utilized. We are very conservative in our expenditures. Whenever we make a commitment to a grant, we, in effect, escrow the funds. So I am not sure that there would be any particular savings in doing this through the budget. There would be some advantages in planning in knowing exactly the budget level.

Senator PROXMIRE. That is fine.

FISCAL YEAR 1988 BUDGET REQUEST

Mr. Whiteside, you are proposing a total 1988 budget of $18.7 million. That is a drop of $798,000, 3.8 percent, in your current budget. However, on page 33 of your justification, you indicate that you will continue your practice of 20 starts and expansions in 1988. CBO suggests that to maintain your program at the current level, you would need a $918,000 increase, up 4.8 percent from 1987, not a decrease.

Will the proposed starts and expansion be implemented at the expense of existing Neighborhood Housing Services and, more to the point, are we short-changing NHS's that we committed to supporting in years past in order to pay for new programs?

Mr. WHITESIDE. Let me again ask George Knight to talk about the mix of starts, and then I would like to respond to the shortchanging question.

Senator PROXMIRE. All right; go ahead, sir.

Mr. KNIGHT. The mix, you will notice, is a slight decrease in activity from some of the programmatic areas, the complementary areas. You will notice a slight change there. Basically, we feel that we will be able to maintain our level of activity of NHS starts at approximately the same level.

Senator PROXMIRE. Mr. Whiteside, you wanted to follow up on that?

MAINTAINING SERVICES TO NEIGHBORHOOD HOME SERVICES

Mr. WHITESIDE. Yes. We work very hard not to leave NHS's in a lurch once we have helped them get organized. One of the important elements of their activity is to finish work in one neighborhood and move into another. Among our starts are those expansions into additional neighborhoods, and they require our assistance because you need a neutral broker, frequently, in dealing with relationships between the old neighborhood and the new, and getting new partners into the program, and so on.

When we maintain our starts in Neighborhood Housing Services, and our multifamily programs at the same level, it is because of our priority to do that, and we reduce in other areas. I can't tell you how important it would be to be able to maintain and increase our activity in the commercial revitalization and the rental housing areas, but the reason for that level start picture in NHS's and the existing multifamily activity is to really keep our faith with a program once we have assisted in its development.

Senator PROXMIRE. I want to follow up on that. You say that you work hard not to leave NHS's in the lurch in the neighborhoods. The essence of your program comes from an understanding that our society has gotten to be too complex for intelligent, caring community leaders to organize without the help of specialists and specialized information.

You provide that expertise and you train these potential community leaders.

Six years ago, I asked whether you could ever let go of a community once it was on its own feet, and you said that you could and you did, although there is a continuing need for training and support service at a reduced level. Last year you told this committee that a number of NHS's were allowed to go out of business due to lack of funds and that in years past you would have been able to shore them up until they got new leadership and funding.

How much would you need to ensure that no legitimate NHS's were permitted to fail solely due to inability to provide support services and training?

Mr. WHITESIDE. May we give you a response to that for the record?

Senator PROXMIRE. Yes; we would like to have that, because this is a superb agency that does a great deal of work and does it, as I have said, at a small cost.

[The information follows:]

FUNDS REQUIRED TO PREVENT NHS DISSOLUTIONS

During fiscal year 1986, we were able to provide intense organizational technical services to eight local Neighborhood Housing Services that were experiencing extreme difficulties. While the final crisis is usually in the fund-raising area, typically this is only symptomatic of deeper issues. These issues might include weak staff or board leadership, inadequate sense of mission, lack of production, and poor management as evidenced by tackling projects beyond the organization's capabilities.

In each case we make a detailed assessment of the situation at the request of the Board and prepare a set of possible intervention strategies. In about three-quarters of the cases we are able to intervene through a combination of technical services (including interim staffing, analysis of financial records, training in lending, construction and management, and organizational development workshops for the partnership) and in last resort, funds to continue operations while devising and implementing a fund-raising campaign.

In rare cases the situation has become so serious that almost all of the partners have become terminally discouraged. In these cases, revitalizing the program would be beyond our ability without regard to resources. In other cases, the ability to grant operating funds and revolving loan funds, and to supply staffing to reenergize the partnership and provide services could enable the NHS to resume production operations. To achieve the reorganizational work necessary to continue these neighborhood housing services would require approximately $250,000 in each case, or about $500,000 at the current rate of NHS dissolutions.

MAJOR CONFERENCES

Senator PROXMIRE. On page 33 of your justification, you indicate that participation at major conferences will be cut by 69 percent, from 1,000 to 313 people whom you would otherwise reach. Have you found that major conferences are not as productive as other activities you have at your disposal and, if so, what are the most valuable means you have to create the leadership needed to regenerate our neighborhood throughout the nation?

Mr. WHITESIDE. Actually, that is a planned alternating sequence of conferences. One year we have a leadership conference similar to the one that you addressed in Milwaukee 4 years ago, where we invite the representatives of the neighborhood, the business community, and local government who are in leadership positions in the NHS, as well as their executive directors. This is a total of four people from each NHS.

The expense of doing that every year doesn't seem justified, so we only do it every second year. But in the odd year we have a smaller conference, which is a very important one. One resident from every NHS neighborhood is invited to participate in a leadership training conference where we are helping those neighborhood residents develop the skills they need to provide leadership to their program. Develop is not the right word, but hone their skills. Many of them are very skilled already.

ROLE OF COMMUNITY DEVELOPMENT BLOCK GRANTS

Senator PROXMIRE. Your community development block grants have played a big role in your program. The President has proposed cutting these grants by nearly $500 million, a 16-percent decrease. I am interested to know what such a cut would mean to your program. Do you have some specifics on what the effect would be? For example, will the 15 neighborhoods you project can achieve self-reliance actually be able to do so despite these cuts?

Mr. WHITESIDE. We can give you that for the record, but I would like to comment that in view of the steady tightening that there has been in the community development block grant program, we have great hopes that this local government secondary market I commented on previously, as well as in my submitted statement, can be produced to reprogram some of those old funds and help local governments assist NHS's, and do other community development projects with the proceeds.

[The information follows:]

IMPACT OF PROPOSED REDUCTIONS IN CDBG

The administration's proposed cut in the Community Development Block Grant Program would have significant impact on the NHS network. NHS's have depended on CDBG funds for their revolving loan funds and capital improvements. The funds have been the source of low-cost capital for NHS's to deal with problem properties and major rehabilitation challenges in lower income neighborhoods. In many of these neighborhoods, alternative sources of low-cost capital are extremely difficult to secure. NHS's moving toward self-reliance with a number of critical projects could be hindered and possibly prevented from achieving self-reliance if they experience major reductions in CDBG funding.

Senator PROXMIRE. If we cut the community development block grant program as the administration is proposing, how would this affect your plans to implement 20 NHS new starts and expansions?

Mr. WHITESIDE. It would make it more difficult and we would have to reach even more vigorously for a secondary market solution. A city government, typically, when we start developing a new program, will make a commitment of, perhaps, $80,000 to $100,000 to pay the development costs of getting the program started; then the city government may also commit $300,000 over a 3-year period to the revolving loan fund of the NHS. If they found their community development block grant resources severely cut, it may be that a number of cities would have to forego contracting with us to develop an NHS.

AVAILABILITY OF LOW-COST CAPITAL

Senator PROXMIRE. Last year, you indicated that the largest obstacle standing in the way of reaching all needy neighborhoods is the limited amount of low-cost capital. In the last month the President took steps to rectify our national trade imbalance, and the result was that the foreign nations who invest in the United States got jumpy and pulled their money out of some markets sending interest rates higher. This is the result of the United States being the largest debtor nation in the world and being dependent on foreign capital.

We now have an enormous federal deficit which is out of control. Our consumers are borrowing as never before. Their debt is higher and their savings are lower in relationship to income than they have been. Our corporations are more deeply in debt than consumers or the federal government is.

If the deficit situation does not improve, what implications do you foresee in the loan market, and what will it mean to those neighborhoods which you have gotten organized and ready to take action? Can you be specific on that?

Mr. WHITESIDE. Yes; and, again, we can expand for the record. I would like to say that one of the concerns that we have is that for lower income neighborhoods, the financial intermediaries are disappearing.

The mergers of banks and savings and loans, the pressure on them to serve more upscale markets, the disappearance of the neighborhood banks, or the neighborhood savings and loan, all of these things are making us turn to ideas like creating community credit unions to serve NHS neighborhoods.

In the past, we have felt that one of our missions was to educate the financial industry about their need and opportunity to serve lower income neighborhoods. But it seems, with all of the problems that you have just discussed, plus the problems of individual institutions, we find an inexorable tide flowing in the other direction. We have not been as successful in recent years in getting the main stream financial institutions to commit to conventional lending in NHS neighborhoods.

[The information follows:]

IMPLICATIONS OF FEDERAL DEFICIT

The limited amount of low-cost capital remains our greatest limitation in improving housing and neighborhood conditions for lower income Americans.

The context of your question highlights the complex interrelationship of variables which keeps our economy on the razor's edge. Relatively small movements in our trade balance, federal deficit, and consumer and corporate debt can have profound impacts on investor and consumer confidence and on the interest rate and rate of inflation. Often the rate of movement of these variables is as important as the direction and amount. Given the economic hazards inherent in the situation, we owe an enormous debt of gratitude to the steadiness of the Board of Governors of the Federal Reserve System.

Ironic as it may seem, too large a reduction in the federal deficit may be as risky as can increasing it.

Lower income residents and their neighborhoods are especially vulnerable to increases in unemployment, in interest rates, or increases in inflation. Anything that produces any one or all of these results negatively, impacts our work and will intensify the need for low-cost capital to supplement the self-help efforts of neighborhood residents and their public and private partners.

EXPANSION OF URBAN HOMESTEADING PROGRAM

Senator PROXMIRE. It has been suggested that the Department of Housing and Urban Development should be more aggressive in disposing of its foreclosed properties. For example, some believe that it would be better to sell such properties for a few cents on the dollar or give them away under the Urban Homesteading Program than to let them sit unoccupied in the HUD inventory and contribute to urban decay.

Does the corporation have any views on this issue?

Mr. WHITESIDE. We are very supportive of the concept you just expressed. Urban homesteading has been an important program that NHS's have participated in with many cities. City governments have turned over to the NHS's the responsibilities of selecting homeowners, providing rehabilitation counsel and rehabilitation lending—taking a house for a dollar, if you are not a construction expert, sometimes is just taking on trouble. You really need someone standing at your side to help you to get it back in good shape.

We would love to see that program expanded—HUD's and VA's housing inventories made available at reduced cost to nonprofit organizations who are serving neighborhoods. We think that the NHS could do a good job in turning those vacant properties into neighborhood assets. We would also like to see the Federal Asset Disposition Association, the new corporation that is taking on responsibility for the FSLIC-owned properties, consider such a course, as well as FNMA, FDIC, and other holders of foreclosed properties.

INCREASE IN ADMINISTRATIVE EXPENSES

Senator PROXMIRE. I just have two other very brief questions.

In comparing your actual 1986 expenditures to your projected 1986 levels, as shown in your justification last year, I note that your telephone, postage, and delivery expenses jumped a whopping 60 percent. Can you explain this?

Mr. KNIGHT. Yes. Basically, it all lies in the telephone lines. There has been a mixup in billings, and the Federal Home Loan Bank Board has paid a considerable portion of our bills in the past. We sought last year to cure that, and we paid $150,000 to the Bank Board that was unexpected and unbudgeted. The trouble all lies in the phone lines.

Senator PROXMIRE. It is interesting, just before you testified, the Home Loan Bank Board testified, trying to explain how their telephone expense was so high. Theirs should have gone down, since yours went up.

Mr. KNIGHT. Theirs is much higher than ours, and I am not sure that $150,000 made a big impact.

If I could go back, sir, to the prior question on vacant homes. The key factor on vacant homes is not only their release, but their speedy release. If they remain in the inventory vacant for a long period of time, their value and, therefore, the cost to rehab escalates dramatically.

Senator PROXMIRE. Another category where you seriously underestimated your actual expenses was other and general administrative expenses. That element jumped 27 percent over your projections. What were the reasons for this?

Mr. KNIGHT. Those costs were largely related, at the urging of our auditors and our audit committee, to complete our computerization while we could still buy the same type of equipment, and they were largely capital costs. We can submit the details for the record.

[The information follows:]

Administrative and general costs expense category

	Expense category—Other general and administrative
Actual expenses,1986	$663,000
Projected expenses, 1986	$523,000
Dollar increase	$140,000
Percent increase	26.8

At the urging of our auditors and audit committee, $100,000 of the increase in this line completed the computerization of information and office systems while we could still obtain compatible microcomputers and software. The remaining increase was related to costs incurred in implementing the reorganization, which resulted in shifts in staffing patterns and office arrangements.

Senator PROXMIRE. Will you have to replace that every few years?

Mr. KNIGHT. These are microcomputers that we use largely as desk stations for word processing and for financial manipulation. They are rapidly becoming out of date in terms of the computer world, but they are quite sufficient for our purposes and will remain so for a long time.

We have a number of NHS's that are still operating with second generation computers, basically, your Apple II's and TRS–3's. They do not have the blinding speed of the new computers, but they work fine.

Senator PROXMIRE. This is very refreshing in contrast to our preceding witnesses who said that they have to keep right up to date with the blinding speed.

Mr. KNIGHT. I am sorry, I missed a lot of the prior testimony, I was delayed getting here.

Senator PROXMIRE. It wasn't your testimony. It was the testimony of the preceding witnesses, the Home Loan Bank Board people, just before you.

Mr. KNIGHT. I didn't hear their testimony.

Senator PROXMIRE. You didn't miss a thing. [Laughter.]

They were fine.

I want to thank you very, very much, Mr. Whiteside, you are certainly doing a great job, and we are indebted to you.

SUBMITTED QUESTIONS

[The following questions were not asked at the hearing but were submitted to the Corporation for response for the record:]

QUESTIONS SUBMITTED BY SENATOR LAUTENBERG

LOCAL GOVERNMENT SECONDARY MARKET

Question: Please elaborate on the secondary market mechanism for local government loans. How will this benefit the NHS network: Will the Mutual Housing Associations also benefit?

Answer: A critical component to the NHS network has been the national NHS secondary market, the only secondary market in the country for low interest rate rehabilitation loans made to homewowners who do not qualify for conventional financing. With a highly successful ten-year track record, this secondary market has been able to sell over $20 million in securities backed by NHS loans to institutional investors at below-market rates. Investors have also committed to purchase an additional $12 million in NHS asset-backed securities.

An expansion of the NHS secondary market mechanism to include local government rehabilitation loans offers excellent long-term potential as a source of, much needed, low-cost capital for NHSs, Mutual Housing Associations and other community development purposes. Existing or future portfolios of local government loans funded form CDBG or other sources could be recycled and the funding used again for similar purposes.

The proceeds would be program income under CDBG regulations, subject to reuse in accordance with CDBG regualtions. Many local governments will welcome the opportunity to obtain funds immediately rather than waiting the 10 to 20 years to be paid in full, even if it means the dollars being discounted to their present value. Many other governments would find it attractive if the loans could be sold at or near par, as is the case in the NHS secondary market.

A local government secondary market would require approximately $1.00 in leverage funds for each $5.00 in loans purchased in the NHS secondary market. To purchase local government loans at par or near par is estimated to require as much as $1.00 in leverage funds for each $3.00 of loans purchased in light of three factors: 1) the local government loans appear to have a lower average yield than NHS loans, 2) the notes backed by the loan portfolio would have to produce a near market yield, and 3) the leverage funds would have to cover administrative costs, rather than the administrative costs being covered by current Neighborhood Reinvestment Corporation grants.

Another factor is that of working capital. Currently NHSA utilizes a $1 million Neighborhood Reinvestment Corporation loan and Neighborhood Reinvestment's grants to warehouse NHS loans until enough have been purchased to warrant a closing under a purchase agreement with an institutional investor. Little of this resource would be available for a local government secondary market. Many "small closings", i.e. under $10 million, would be objectionable to the institutional investor, and one or more simultaneous closings, i.e. where the loans were closed with the local governments simultaneously with the notes being closed with the institutional investors, would be awkard and time consuming.

In order for such a secondary market to effectively recycle capital on an ongoing basis, both a working capital revolving fund and annual leverage funds would be required.

BENEFIT TO NHS AND MUTUAL HOUSING ASSOCIATIONS

Question: How will this benefit the Neighborhood Housing Services and Mutual Housing Associations?

Answer: Since 1981, there has been a heavy constriction of the supply of low-cost capital available for lower income housing and community development purposes -- both federal and private sources. As federal cuts began to be felt, foundations and other private sources of low-cost capital encountered an enormous surge of demand for their grants and low interest loans, and had to become more selective. While the levels of giving increased, few foundations and corporations included community development or housing among their priorities.

A major use of low-cost capital by NHSs is in the purchase, and rehabilitation of vacant buildings for future resale or rental. This is critical work because the existence of vacant buildings has a blighting effect and inhibits reinvestment in nearby properties. Rehab of vacant buildings for sale in a lower income neighborhood requires a subsidy or low- interest loan (or both) so the completed building can be sold at a price and with a down payment and monthly payments affordable to buyers within the income level of the neighborhood. Reduced, and spasmodic, availability of Section 312 rehabilitation loans and reduction in Community Development Block Grants have reduced the capacity of NHSs to carry out this essential neighborhood revitalization strategy.

It is clear that an increase in the availability of low-cost capital would benefit the overall missions of NHSs and Mutual Housing Associations in stabilizing and revitalizing their communities.

Other urgent neighborhood revitatilization projects both NHSs and Mutual Housing Associations have preliminarily proposed for support by the local secondary market include:

- Multi-family housing developement, both rehab and new construction,
- Rehabilitation and sale projects.
- Homeownership promotion projects assisting neighborhood tenants acquire and rehabilitate vacant propertie,
- Economic development and commercial revitalization projects,
- Re-capitalization of revolving loan funds,
- Development of additional Mutual Housing Associations,
- In-fill construction on scattered sites,
- Construction of new homes in small subdivisions on city-owned land,

- Purchase and rehabilitation of units for long-term use by homeless families.

While the programmatic solutions the Neighborhood Reinvestment Corporation can offer to such a broad national need may appear modest, the Corporation's large volunteer public-private partnership network can make a significant contribution by maximizing private and local support and lessening the costs of a public response. Expansion of the NHS secondary market holds promise as a productive way to leverage federal support through public-private partnerships.

SOCIAL INTERVENTION STRATEGIES

Question: Improving the quality of life in lower income neighborhoods often means tackling social problems, like teenage pregnancy, youth unemployment and under-education. What, if anything, can Neighborhood Reinvestment's network of neighbhorhood-based partnerships do to address these issues?

Answer: We have been working for over a year on a way to assist NHS neighborhoods in addressing the social issues which impact many of their communities. We have concluded that -- in discussion with the National NHS Advisory Council, our own staff Social Intervention Committee, and from the reaction of last September's National Residents Conference -- Neighborhood Reinvestment.

We have approached the situation by identifying specific, small projects which could make a positive impact, then achieve scale by replicating the projects in scores of appropriate neighborhoods. We intend to make these models available to the NHS network, not directly through the NHSs, -- which have more than enough to do in their work on economic and real estate aspects of the neighborhood -- but through appropriate social service agencies which also serve NHS neighborhoods. The linkage to these agencies will be through the neighborhood leaders on NHS board of directors.

Kinds of projects we have reviewed include the following:

- a network of small (2-6 children) day care facilities in a neighborhood utilizing the skills of mothers with stable families (and incidentally providing employment for a number of neighborhood mothers);
- nuturing care for children of teenage mothers in these day care facilities;
- coaching by volunteers in mothering skills for the teenage mothers;
- tutoring by volunteers in meeting educational needs of the teenage mothers; and
- mentoring and coaching by volunteers in skills and attitudes which would foster the teenage mothers' employability.

NATIONAL INSTITUTE OF BUILDING SCIENCES

STATEMENT OF HERMAN J. SMITH, CHAIRMAN OF THE BOARD

ACCOMPANIED BY:
RENE A. HENRY, JR., PRESIDENT AND CHIEF EXECUTIVE OFFICER
JOHN LLOYD, CONTROLLER

OPENING REMARKS

Senator PROXMIRE. The subcommittee will now turn to the National Institute of Building Sciences. Although Congress provided this agency with its final appropriation in the fiscal year 1984 budget, we continue to exercise oversight responsibility over its management and operations.

The institute is a nonprofit, nongovernmental corporation authorized by Congress to support the development of nationally recognized building performance criteria in order to maintain public safety and health.

With us today is the Institute's Chairman of the Board, Mr. Herman J. Smith.

Mr. Smith, it is a pleasure to welcome you and your colleagues to the subcommittee. I have had an opportunity to review your statement, which will be included in full in the record. If you would like to summarize your testimony, please feel free to do so.

One of my friends, and a man that I greatly admired, was a man named Herman Dunlop Smith of Lake Forest, Ill., who was an insurance executive. I think he was the chief executive officer of Marsh McClennan, a very well-to-do man. I presume, he was a relation of yours.

Mr. SMITH. Under those circumstances, I am going to claim him, although I do not remember him.

Senator PROXMIRE. But you are not a relation.

Mr. SMITH. No.

Senator PROXMIRE. That is sad for him.

If you would like to summarize your testimony, please feel free to do so.

Mr. SMITH. Thank you, Mr. Chairman. I will. It is good to be back in your presence.

INTRODUCTION OF ASSOCIATES

As the testimony states, I am Herman J. Smith of Fort Worth, Tex., and Chairman of the Board of NIBS. With me today are Rene Henry, Jr., President and Chief Executive Officer of NIBS, and John Lloyd, our Controller.

SUMMARY OF STATEMENT

I realize, Mr. Chairman, that I cannot be comprehensive in the short period of time allotted. However, I would like to cover some of the high points in our report.

Senator PROXMIRE. I would appreciate that, and your statement will be printed in full in the record. If you could summarize it, we would be grateful.

Mr. SMITH. Thank you, sir.

HOUSING REHABILITATION

On the subject of housing rehabilitation, which I think is a very good subject to follow the previous testimony, yesterday, April 23, the Institute launched a study with what we believe are major implications for housing rehabilitation in America.

We brought together a group of housing experts and leaders to develop a prudent plan for using more fully America's existing housing stock. We have set out to investigate the problem of public and privately owned buildings that are vacant, foreclosed, and abandoned.

HOUSING FOR LOW-INCOME FAMILIES

We will consider what incentives and public and private initiatives that can induce the marketplace to meet the housing needs of low-income families and the homeless. The previous testimony a few minutes ago gave a gloomy forecast as far as the availability of low-income housing. I think that we need to look more carefully at existing housing, especially vacant housing.

The NIBS group will measure the extent of the problem, consider the role of building codes in exacerbating or alleviating the problem, examine the impact of zoning, investigate regulatory aspects, appraise possible finance and tax incentives, and analyze how innovative and existing technology can be brought to bear on solutions.

The Neighborhood Reinvestment Corporation was present at our conference yesterday and were very helpful.

FOREIGN INFLUENCES ON U.S. CONSTRUCTION INDUSTRY

On the subject of foreign influences on the U.S. construction industry, on April 15, the Institute convened another high-level task force. Foreign construction materials, components, and equipment command a substantial marketplace in America today. We are concerned on how this affects our manufacturing resources within this country.

The Institute has announced three forums to be held in June pertaining to industrialized and manufactured housing in the United States. We will be looking especially into the regulatory aspects of factory-built housing and the HUD mobile home code. The task force will seek to gain participation from a wide range of interested individuals and organizations.

ASBESTOS ABATEMENT

On the important subject of asbestos abatement in buildings, we have published a book, "Model Guide Specifications, Asbestos Abatement in Buildings." We found this to be an authoritative, comprehensive guide specifications, providing technical language for procuring asbestos abatement services. In the book, we provide model guide specifications for abating asbestos.

I might add, Mr. Chairman, that in this particular study, the Institute was able to bring together some of the most outstanding individuals in the country who have a thorough technical knowledge of this problem: A consensus report was the result of this publication.

AFEIS

Another item of interest to us is the automated facilities engineering information system [AFEIS]. The Institute has joined with several federal agencies on a program that produces major improvements in the ability of architects and engineers to obtain and search through technical criteria documents.

For example, we have been able to contain over 100,000 pages of technical information on a 4.7-inch-diameter CD-ROM disk that can be pulled up at a moment's notice by the experts in the field. Not only will this improve the ability of architects, engineers, and others, to serve these federal agencies, but it will be tremendously helpful in improving the agencies' design and construction procurement management.

INDOOR AIR QUALITY AND RADON

A new subject that is of major concern to a lot of people is indoor air quality and radon. Recently, the Institute published proceedings of a workshop held last year on radon gas. The workshop drew nearly 100 attendees to hear speakers from three federal agencies and a number of private corporations. It provided a forum for exchanging radon data among researchers, designers, builders, regulators, and others, and we will follow through on this subject.

FIRE HAZARDS

Last year we conducted a fire hazard conference and as a result, initiated a project to develop new performance test methods to ensure that fire toxicity potential of building products and building contents under actual fire conditions can be published and met.

SEISMIC HAZARDS

With funding from FEMA, under its National Earthquake Hazards Reduction Program, the Building Seismic Safety Council has developed publications to foster building design to resist seismic hazards.

BUILDING TECHNOLOGY RESEARCH AGENDA

We have gotten into the subject of building technology research agenda for the National Bureau of Standards. The Institute identified and set priorities for building community research needs.

BUILDING CODES

We have mentioned in our written report that common formats for building codes are important as well as building thermal envelope research.

WOOD PROTECTION

Wood protection is another subject that we thoroughly covered, and booklets were published on this subject.

PUBLIC AND PRIVATE PARTNERSHIP

I might conclude, Mr. Chairman, by saying that many of these achievements and activities were made possible by the remarkable public and private partnership forged at the Institute, partly as a result of the matching funds program established in 1984.

Under the program, the federal government matches in each fiscal year, through a U.S. Treasury trust fund, each dollar up to $500,000 contributed to the Institute by the private sector. In every year since the program was enacted, private sector members, donors, and other participants have provided more than the necessary $500,000.

In addition to cash contributions, more than $1 million worth of in-kind technical services from various experts in the private sector. Through volunteer efforts, have helped our Institute activities.

The funds from the trust have allowed us to provide seed money and considerable funding for most of the projects I have outlined to you today. The partnership represented by NIBS between the private building community and the federal government observes the spirit of the authorizing legislation and continues to be of substantially greater value than the amount of the federal contribution.

Mr. Chairman, I appreciate the opportunity to appear before your committee. We will certainly be pleased to answer any questions you might have.

[The statement follows:]

STATEMENT OF HERMAN J. SMITH

Mr. Chairman and Members of the Subcommittee, I have the honor to represent the National Institute of Building Sciences (NIBS) before the Subcommittee. I am Herman J. Smith of Fort Worth, Texas, and I am chairman of the board of NIBS. With me today are Rene A. Henry, Jr., president and chief executive officer of NIBS, and John Lloyd, controller.

We will report on the work of a vigorous and effective Institute at the forefront of concerns facing the building community and affecting every American who lives, works, worships, or is entertained in buildings. At NIBS we are addressing issues ranging from competitiveness in construction to radon in the basement and asbestos in the ceiling.

Our board, our staff, and most importantly our valued volunteers from across the country who constitute our substance and constituency, delve into these concerns in the most prudent, cost-effective ways we can devise, resolving problems, not by regulation nor by pressure nor by dollars alone, but by reason and by data and by consensus.

I realize, Mr. Chairman, that I cannot be comprehensive in the time alloted. In my report, I will cover the Institute's most important current activities in the areas of:

- Housing rehabilitation
- Foreign influences on U.S. construction
- Factory-built housing
- Land use and development
- Asbestos abatement in buildings
- Automated Facilities Engineering Information System
- Indoor air quality and radon
- Fire hazards
- Building seismic safety
- Building technology research agenda
- Common format for building codes

- Building thermal envelope research
- Wood protection

I will report on the status of these projects and I will report on our stewardship of the federal funds entrusted to us, and on the success of the concept of public-private partnership embodied in the U.S. Treasury Trust Fund.

Housing Rehabilitation

On April 23, the Institute launched a study with what we believe are major implications for housing in America. We brought together a group of housing experts and leaders to develop a prudent plan for using more fully America's existing housing stock.

The Housing and Urban Development Department has reported that of 1.3 million publicly-assisted housing units, more than 82,000 now are vacant. In many cities, we see boarded up housing and buildings, with people sleeping on the streets only blocks away. HUD, the Veterans Administration, the Government National Mortgage Association, the Federal National Mortgage Association, and the Federal Home Loan Mortgage Association now own housing units that could perhaps be made available to those in need.

I have elected to chair this group personally, and we have set out to investigate the problem of public and privately-owned buildings that are vacant, foreclosed, and abandoned. Also the nation's older industrial cities have a large stock of vacant buildings -- not always in residential neighborhoods -- that could be adapted and retrofitted for residential use.

We will consider what incentives or innovations private-public initiatives can create to induce the marketplace to meet the housing needs of low-income households and the homeless.

The dramatic changes in local economic conditions in some geographic areas, including the industrial areas of our North Central States and the energy production areas in the South Central States have left many moderate-income residential neighborhoods of homeowners with vacant housing units and with limited resources available for keeping their units maintained to the existing standards of health and safety.

The federal government, in this time of budget cuts, has limited rental assistance to lower-income households and is ceasing to construct new housing units for the poor. The stock of public housing is declining. At the same time, vacancies are high because of a need for repairs and a lack of money to pay for them.

The NIBS group will measure the extent of the problem, consider the role of building codes in exacerbating or alleviating the problem, examine the impact of zoning, investigate regulatory aspects, appraise possible finance and tax incentives, and analyze how innovative and existing technology can be brought to bear on solutions.

We plan to do extensive research and hold hearings in several major U.S. cities this year, and will report our findings not only to Congress but also to the Presidential Task Force on Regulatory Relief, at the request of its chairman, Vice President Bush.

This is one of our projects that is made possible because seed money is available from Institute funds provided by the public-private partnership I have mentioned.

Foreign Influences on U.S. Construction

Earlier, on April 15, the Institute convened another high level task force to investigate foreign influences on the U.S. construction industry.

A previous study by NIBS showed that the United States spends a smaller proportion of its building dollars on construction R&D than does almost any other developed country, even though this industry represents $313 billion of our GNP and accounts for nearly nine percent of all jobs.

Meanwhile, immense foreign investment in American real estate now is driving construction and related industries. Foreign construction materials, components, and equipment command substantial market share in

America. Japanese, British, Yugoslavian, and other foreign contractors are now doing business in the United States. With offshore general contractors, we are finding that architectural and engineering services also are provided from offshore and the materials specified are not always those that would have been specified by an American firm. The result is a domino effect.

David Smith, immediate past president of the National Association of Home Builders, has accepted the chairmanship of this task force, which will include prominent financiers, academics, industry executives, architects, and engineers. Our first product will be a series of monographs on the topics I have just suggested, laying out the problem and possible solutions in cold, factual terms.

Factory-built Housing

The Institute has recently announced three forums to be held in June in Orlando, Fla., Indianapolis, and Newport Beach, Calif., on industrialized and manufactured housing in the United States. We will be looking especially into the regulatory aspects of factory-built housing and the HUD mobile home code.

Housing that is partially or completely built in factories has long been of special interest in the American building community. It sometimes is regulated differently from other types of housing. Its land use is zoned differently and often discriminatorily. It is subject to particular pressures from foreign competition.

We will publish the proceedings of these forums this year.

Land Use and Development

Also announced early this month by NIBS was a nationwide task force to study how American counties, cities, and states regulate land development and to draft new land use guidelines.

There has been little basic change since 1924 in the way most states and communities control zoning and regulate land use development. Most regulations and standards in use now are based on standard zoning and planning enabling acts published by the Commerce Department in 1924 and 1928.

The task force will hold roundtables in a number of U.S. cities this year and will seek to gain participation from a wide range of interested individuals and organizations. We expect to produce a handbook for nontechnical audiences on new land development guidelines and criteria.

Asbestos Abatement in Buildings

So far, I have reported plans for material to be produced this year. As a result of work done in 1985 and 1986, the Institute has produced one of our most directly useful publications. Model Guide Specifications, Asbestos Abatement in Buildings is the nation's only authoritative, comprehensive guide specifications providing technical language for procuring asbestos abatement services.

Offered to the country's architects, engineers, asbestos abatement contractors, and others, the book has sold 2,000 copies so far and orders are coming in at a rate of 10 to 15 a week. In James Michener terms, that's not a lot. For a book of this technical complexity, it is gratifying.

In the book, we provide model guide specifications for abating asbestos in four ways: encapsulation, containment, removal, and repair and maintenance. We point out that asbestos containing materials (or ACM) in a building are not necessarily a health hazard. It is when ACM are damaged, deteriorating, or disturbed that they are most likely to emit hazardous asbestos fibers into the air. So it is not necessarily wise to tear out ACM wherever and whenever they are found in buildings when other abatement techniques are available.

This book is a substantial contribution to the public welfare.

Automated Facilities Engineering Information System

The Institute has joined with several federal agencies on a program that produces major improvements in the ability of architects and engineers to obtain and search through technical criteria documents. Principal potential beneficiaries so far are the Naval Facilities Engineering Command, the Corps of Engineers, the National Aeronautics and Space Administration, and the architects and engineers who perform work for these agencies.

First, we took approximately 5,000 pages of Navy guide specifications, reworked them, and converted them into the standard WordPerfect and Wordstar word processing formats, usable on most personal computers. Each set is contained on about 50 floppy diskettes. The National Society of Professional Engineers and the American Consulting Engineers Council are distributing these. We call this our Floppy Copy program.

The next generation was to place the Navy guide specs along with guide specs of the Army Corps of Engineers and of the National Aeronautics and Space Administration on a recently developed device called CD-ROM, (for compact disk, read only memory). The technical manuals of these agencies will soon be included on the same compact disc.

A single CD-ROM, only 4.7 inches in diameter, can contain all this information and a great deal more. This technology, combined with a full-text search and retrieval program, makes it possible for a user to locate in seconds data that it used to take days or weeks of research to find.

Not only will this improve the ability of architects, engineers, and others to serve these federal agencies, but it will tremendously improve the agencies' own design and construction procurement management. AFEIS has already been demonstrated and is being perfected now and readied for distribution and marketing.

Indoor Air Quality and Radon

Recently, the Institute published proceedings of a workshop held last year on radon gas. The workshop drew nearly 100 attendees to hear speakers from three federal agencies and a number of private corporations. It provided a forum for exchanging radon data among researchers, designers, builders, regulators, and others. The workshop and the published proceedings provide practical guidance on the radon hazard to home builders, home repair contractors, designers, and government officials.

Another radon workshop or publication aimed at providing radon data to nontechnical people such as real estate people, homeowners, developers, and investors is now being considered, possibly for in the fall of this year.

This is only one of the issues the Institute's Indoor Air Quality Committee is addressing.

Fire Hazards

In August, NIBS will conduct NIBS Fire Hazards Conference II. Fire hazards including toxicity of the products of combustion have been a major concern of the Institute in the last four years. During 1986, we led in national efforts to bring reasoned judgment to these issues.

We conducted Fire Hazards Conference I last August in Gaithersburg, near the Center for Fire Research of the National Bureau of Standards. As a result of that conference, we initiated a project to develop a new performance test method to measure the fire toxicity potential of building products and building contents under actual fire conditions. In Fire Hazards Conference II, we expect to present the results of this project.

In a related development, State of New York authorities have modified implementation of regulations requiring laboratory testing for toxic potency of building materials and products. The Institute has repeatedly held that current tests for combustion toxicity fail to yield data suitable as a basis for regulation. NIBS Fire Hazards Conference I and its findings were cited in discussions that led to the modifications.

This is another effort that NIBS might have been unable to undertake had funding not been available through the public-private partnership.

Building Seismic Safety

With funding from the Federal Emergency Management Agency, under its National Earthquake Hazards Reduction Program (NEHRP), the Building Seismic Safety Council (BSSC) has developed publications to foster building design to resist seismic hazards. The BSSC is an independent, voluntary body organized under the auspices of NIBS.

The BSSC's work responds to two insufficiently recognized facts: First, 44 states and many U.S. population centers are at risk from earthquakes. Second, in most earthquakes, falling buildings are the killers.

The BSSC delivered and FEMA published NEHRP Recommended Provisions for the Development of Seismic Regulations for New Buildings, plus a number of supplementary documents. Now, the BSSC has developed for FEMA and is implementing A Plan for Stimulating Widespread Use of the NEHRP Recommended Provisions. This includes widespread distribution of the documents and a number of public information efforts including dissemination of information developed by BSSC about the seismic problems related to elementary and secondary schools, motels and hotels, and hospitals and other health care buildings; a hotline; a national forum solicitation campaign; and a speakers bureau. Finally, since even seismic-resistant buildings cannot function without essential services, the BSSC is developing for FEMA a project on mitigating seismic hazards to lifelines. Lifelines are those parts of the infrastructure that carry essential services such as power, gas and liquid fuel, water and sewage, transportation, and communications.

Building Technology Research Agenda

For the National Bureau of Standards, the Institute identified and set priorities for building community research needs compatible with the capabilities of the Bureau's Centers of Building Technology and for Fire

Research. NIBS identified specific research programs through a survey of building community professionals. Results of the surveys were refined in meetings and correspondence between members of the building community and representatives of the Centers, and a final report was approved by ballot of committee members.

Common Format for Building Codes

The Institute has worked with the National Bureau of Standards and the Federal Trade Commission (FTC) to study the potential of a common code format to improve the way technical provisions are organized in building codes. Code users surveyed indicated strong belief that a common format would benefit the building community. The Institute will continue to study this topic. A report to this effect was delivered to and accepted by the FTC.

Building Thermal Envelope Research

The Building Thermal Envelope Coordinating Council (BTECC) has drafted a third edition of a National Program Plan for the Thermal Performance of Building Envelope Systems and Materials (NPP III). The group will hold a prepublication hearing on NPP III in June.

NPP III, update of a version first issued in 1979, will assist the Department of Energy, other agencies, and private organizations interested in building energy research and policy. Like the BSSC, BTECC is an affiliated council of NIBS, organized under the Institute's auspices.

Wood Protection

Another affiliated council of NIBS, the Wood Protection Council (WPC), has published a useful booklet entitled Indoor Sampling Guidelines for Termiticides. Termiticides are toxic chemicals, safe when properly used but potentially hazardous when misused. Scare stories arising from termiticide misuse have led to calls for draconian remedies when, in fact, the most rational response would be for careful training and monitoring of termiticide users and proper air sampling when termiticide contamination is suspected. The WPC's booklet was prepared by a technical committee under the supervision of a Board of Direction. WPC volunteers include government experts, toxicologists, entomologists, wood products professionals, and manufacturers.

Mr. Chairman, many of these achievements and activities were made possible by the remarkable public-private partnership forged at the Institute partly as a result of the matching funds program established in 1984. Under the program, the federal government matches in each fiscal year through a U.S. Treasury trust fund each dollar up to $500,000 contributed to the Institute by the private sector.

In every year since the program was enacted, private sector members, donors, and other participants have provided more than the necessary $500,000.

In addition to cash contributions, more than $1 million worth of in-kind technical assistance was provided by private sector volunteers in Institute activities. Actually, if we included preparation time of the volunteers, participation in affiliated councils, and other indirect contributions, that estimate would more than double. These activities provided opportunities for government professionals to interact with private counterparts to the benefit of all.

The funds from the Trust Fund have allowed us to provide seed money and considerable funding for most of the projects I outlined to you today. The partnership represented by NIBS between the private building community and the federal government observes the spirit of the authorizing legislation and continues to be of substantially greater value than the amount of the federal contribution.

From this report, I trust that the Subcommittee will discern that the National Institute of Building Sciences is accelerating its response to the Congressional mandate that we constitute an authoritative source of information and findings on building sciences and technology. We are also bringing new vigor to our assigned missions of developing a more rational regulatory environment and encouraging the introduction of innovative technology into the building process.

Mr. Chairman, I welcome your questions and those of the other Members.

QUALITY OF FOREIGN GOODS

Senator PROXMIRE. Thank you very much, Mr. Smith.

Mr. Smith, you have mentioned the activities of your task force regarding foreign influences on U.S. construction. I am concerned about the quality of some of these foreign goods, and I wonder if your task force is examining this issue. Specifically, plastic pipe used for water supplies in this country must meet a high standard of quality as required by the domestic pipe producer community itself.

However, foreign pipe is not tested and will, on occasion, contain unacceptable levels of lead, thus potentially poisoning our children. In another case, high-strength bolts have been found to be counterfeited, leading to the failure of connections on structures such as bridges and buildings, despite the best efforts of builders to use proper materials.

Is this issue under examination, and is there any hope that such products can be removed from our marketplace?

Mr. SMITH. Mr. Henry attended the meeting of that task force. I would like him to comment on the further studies and the way the facts will be forthcoming.

Mr. HENRY. We divided our efforts into six categories, one of which will be looking at the materials impact, including plastic pipe and high-strength bolts. We know that there have been failures, for example, in steel, which is self-tested by the manufacturer and which, in some cases, has not met the standards required here. We also want to look at cement. Sixty-five percent of the cement that is used in this country is either controlled by or brought in from offshore interests.

We are following the money in investment, as well as the capital infusion and the impact and influence on the interest rates. We certainly want to follow what is happening with Japanese investment in T-bills and in the secondary mortgage markets. This issue was brought up by some of the people on our committee.

We will be having meetings of the six subcommittees in the next 3 weeks, and then we will have a meeting of the full committee again before the end of May. We hope to have at least one other monograph published before the end of the year.

Mr. SMITH. One thing that concerns me on that subject is that some of the general contractors coming into the country are owned by large foreign banks. You can see where this relationship could lead to if we are not careful.

Senator PROXMIRE. As chairman of the Banking Committee, I am concerned about that.

Mr. SMITH. We will make our reports available to you as we receive information that we think is worthwhile.

Senator PROXMIRE. Thank you.

Mr. HENRY. Japanese construction companies did $1.7 billion of business in this country last year. We have also seen the Koreans, Yugoslavians, and other foreign-based companies coming into the country. When they do business here, we not only lose the architecture that is going offshore and the engineering that is going offshore, but the material specifications as well. It is a very important problem.

Senator PROXMIRE. Are we able to go to those countries?

Mr. SMITH. Mr. Chairman, as you know, in most cases, this is not the case. There is a big argument now going on regarding the new Japanese airport at Narita.

Mr. HENRY. Senator Murkowski is looking into that and spoke the day before yesterday about reciprocity. The Japanese are closing us out of their contracting market, particularly for this airport.

HOUSING REHABILITATION STUDY GROUP

Senator PROXMIRE. Mr. Smith, in your statement you refer to a housing rehabilitation study group you are chairing. I commend you for seeking ways to upgrade our housing stock because, as you imply in your testimony, it is much more cost effective to maintain existing units than it is to build new ones.

Our previous witness, Mr. William Whiteside, has, in my judgement, done an excellent job of stimulating local communities to deal with substandard and abandoned housing. Can you tell us what role his organization, the Neighborhood Reinvestment Corporation, would play in this study?

Mr. SMITH. I concur with your previous remarks.They are doing an excellent job in the field. Their representatives were present at our meeting. They have certain studies that are going to be incorporated into our report.

One of the aspects of the studies from yesterday shows that there could be savings of as much as $5,000 to $8,000 in the cost of rehabilitating certain units just by eliminating unnecessary paperwork. We are now losing over 100,000 low-income housing units per year. With this kind of red tape the rehabilitation program effectively becomes an economic demolition program.

Consequently, we are going to go to work hand in hand with these people to find a solution.

Senator PROXMIRE. The Neighborhood Reinvestment Corporation has been pushing the mutual housing concept as a means of maintaining a long-term housing stock. Of course, this approach can be applied to rehabilitated housing as well as newly constructed housing and it makes it possible for low-income families to have a lifetime home. Is this the kind of concept your study group might look into?

Mr. SMITH. Yes, sir; and we also concur that repossessed property is a problem in the country today.

RADON GAS

Senator PROXMIRE. You have an interesting section on radon. Let me pursue that a little bit.

You noted that indoor air pollution by radon gas has been a major seminar and workshop subject for you. I am interested in what you might be doing to prepare written guidelines on how to deal with indoor radon problems, as you have done with asbestos.

Homeowners need good hard data on what they can do to fix their homes, and builders and architects need specifics on how to build homes and buildings so as to prevent radon pollution. I understand that radon is the second leading cause of lung cancer and it is also causing something like 25,000 to 28,000 deaths a year. Have you prepared such materials, or are you doing so at this time?

Mr. SMITH. We now are in the process of obtaining the information, Mr. Chairman. As you know, the National Institute of Building Sciences is not a large budgeted organization. We receive a tremendous amount of help from experts in the field. We have over 50 experts working in this field inside and outside of government. Our goal is to come up with a set of written recommendations as soon as possible.

I might add that we would hope that a system could be devised, with the help of our volunteers, that would allow citizens to measure the radon capabilities——

Senator PROXMIRE. Let me interrupt you. You said that you hoped to come up as soon as possible with the guidelines, or with a handbook. What kind of period are we looking at? Is that a matter of a couple of months?

Mr. HENRY. We have scheduled a task force meeting. Everything that has been heard to date has been very technical from the scientific people. We have had interest shown by the Harvard-MIT Joint Center for Housing Studies asking us to bring together realtors and the lenders who are facing as many problems as builders. At the task force we will determine if and where a conference will be most helpful. The National Association of Home Builders' Research Foundation also is studying radon for the EPA.

Senator PROXMIRE. What we need is a workbook on how to fix houses, something that would be helpful to people.

Mr. SMITH. I agree. We will be proceeding in this direction. I think that it can be done in less than 6 months.

STAFFING ACTIVITIES

Senator PROXMIRE. Mr. Henry, every agency which comes before this subcommittee gets a thorough review of its personnel practices, including staffing levels and pay increases. I understand that you are independent of the government and you don't get any federal money. But in reviewing your 1988 plans, some questions about your staffing activities arise.

DUTIES OF PRESIDENT EMERITUS

First, would you please explain the duties of the president emeritus. I note that this is a new position, funded at a level of more than 80 percent of Mr. Brewer's salary last year.

Mr. SMITH. We have a contract relationship with Mr. Brewer. It was considered that upon his retirement, or partial retirement, that he would work with several of the larger corporate entities that are making contributions. His duties over the next 18 months will be in coordinating the funding activities with the corporate community, which far more than offsets his expense. He will be phased out at that time.

ASSISTANT CONTROLLER

Senator PROXMIRE. Another new position is that of Assistant Controller. This is a title often used in federal agencies and bureaus, but I have never seen it in an agency of only 18 people. What justifies adding this position?

Mr. SMITH. This position was temporary, and it doesn't exist currently. Mr. Lloyd has been brought in to take the position of Controller.

DIRECTOR OF COMMUNICATIONS

Senator PROXMIRE. Another area where some explanation would help me understand your staffing activities is in communications and public information., It appears that you released your public information specialist in 1986 and, in essence, added that $10,000 salary to the salary of your Director of Communications.

Can you tell us how you decided to increase the salary of your Director of Communications by over $10,000 in 1 year?

Mr. HENRY. My predecessor is the one who made that decision, but the salary level was well below the market level for somebody qualified to be in that position.

Senator PROXMIRE. It is well below what the Congress did for itself. I voted against it, and so did everybody else. They said, "No, but take the dough."

Mr. HENRY. The salary level for that position was necessary to get someone qualified to do the job that we need to do at the Institute.

Mr. LLOYD. If I may, the other position was only a part-time position, which came about originally due to funding problems.

Senator PROXMIRE. I am delighted to note that you are an unusual organization in that your income has been consistently outstripping your expenses. You could teach the government a lesson here.

Mr. SMITH. We are attempting to raise funds in the fields that benefit from these services.

TRUST FUND

Senator PROXMIRE. As a consequence, your surpluses are growing. That is a sign of good management. However, I question whether you really need a trust fund that is producing $500,000 a year when you are making up surpluses of between $200,000 and $400,000 a year. Wouldn't it make sense to gradually phase out the trust fund in anticipation of its expiration date?

Mr. SMITH. No, sir; and let me give a couple of reasons as a layperson serving as an unpaid board member. No. 1, you do fund part of the program. Consequently, this is a nonprivate group with many diverse building experts. Based on this trust fund concept, we have been able to solicit companies throughout the country for matching funds to the federal government.

We are exceeding the $500,000 limit because we get into items such as building seismic safety, radon, indoor air quality, and toxicity of fire hazards.

If we lost federal involvement as a 5-year trust fund, we would lose the emphasis and direction that committees like yours can make. It has been a good marriage and I would certainly recommend beyond my time on the board that you continue.

Senator PROXMIRE. Thank you, sir, for your very excellent testimony. This is again the kind of agency that we can all be proud of; it does a good job.

SUBCOMMITTEE RECESS

The subcommittee will stand in recess until next Friday, May 1, at 10 a.m. in room SD-124, when we will take testimony from several witnesses on the proposed space station.

[Whereupon, at 12:15 p.m. Friday, April 24, the subcommittee was recessed, to reconvene at 10 a.m. Friday, May 1.]

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